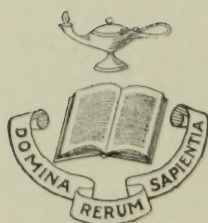



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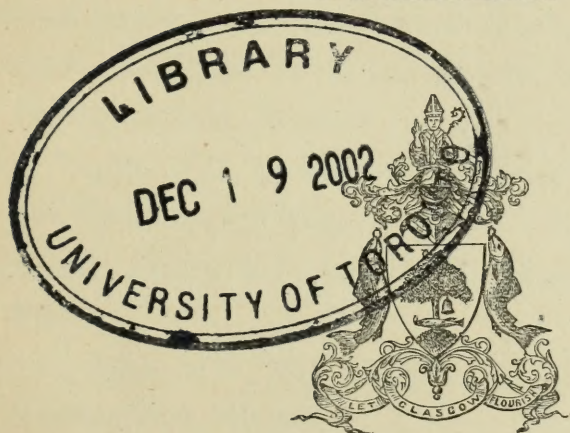
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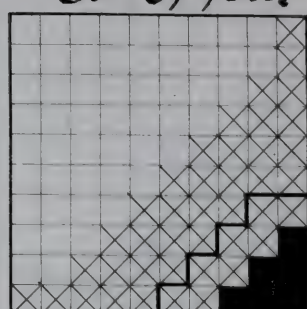
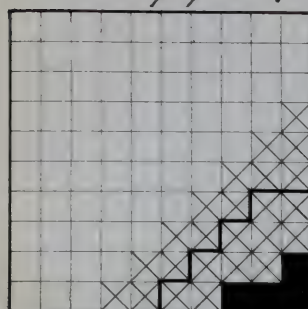
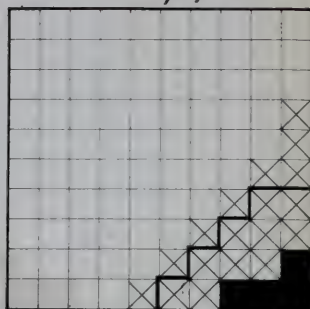
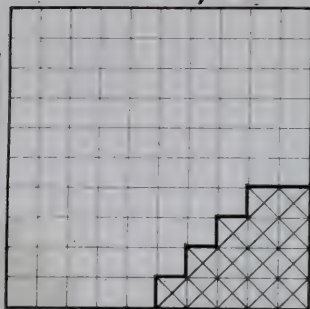
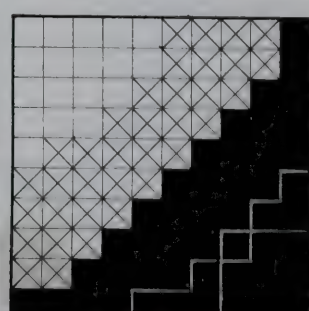
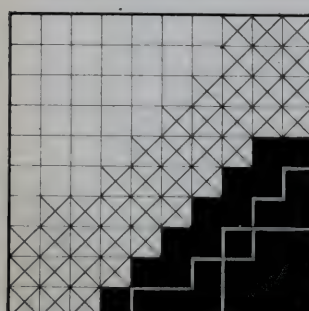
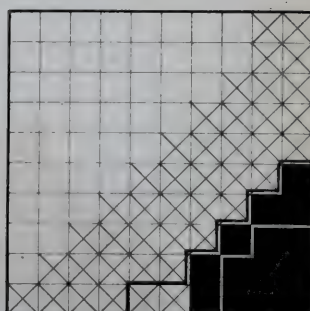
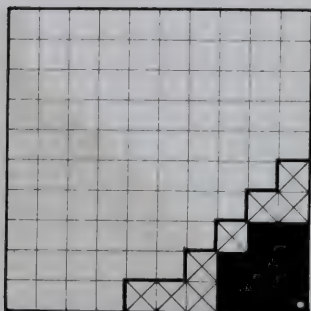
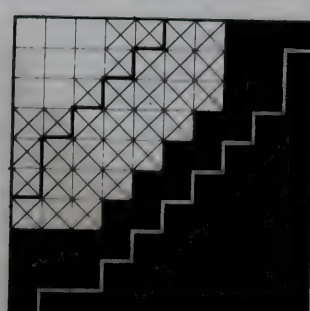
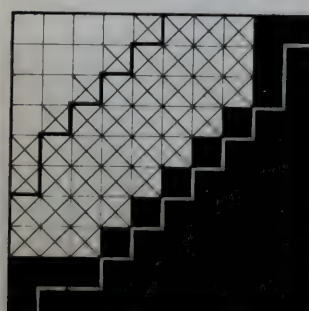
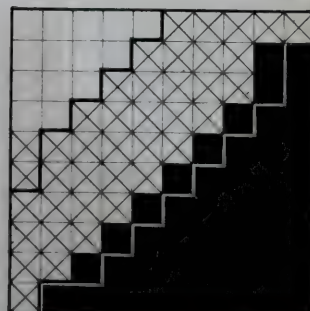
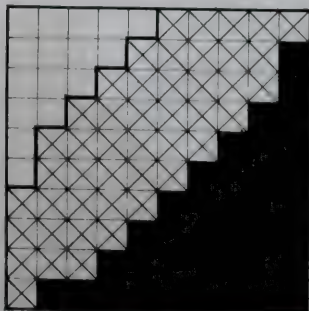
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0-9 years.

10-14 years.

20-29 years.

30-39 years

Good V. M.Bad V. M.Unvaccinated

Pure Eruption



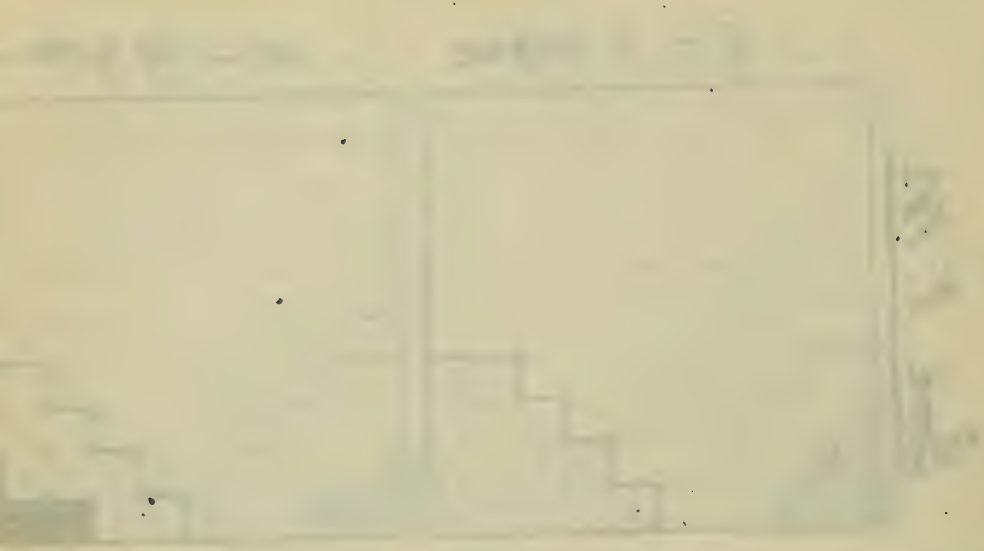
Copious Eruption



Confluent Eruption



N.B. The large squares contain 100 smaller ones, so that the varieties of the smaller squares represent percentages.



The above
 are the frequency
 distributions of the
 data.

DIAGRAM ILLUSTRATIVE OF DR RUSSELL'S PAPER.

The general design of this diagram is to exhibit to the eye the variable percentages of "rare," "copious," and "confluent" eruption found at different decades of life, in the *unvaccinated*, those who have a *bad vaccine mark*, and those who have a *good vaccine mark*. The following are the principal points which this diagram illustrates :—

I. *Vaccination diminishes the original extent of the eruption.* (p. 13.) This will be evident to any one who contrasts the squares *vertically* passing from below upwards, especially in the column "0—9 years."

II. *Age has a slight influence in increasing the tendency to confluence in the natural disease.* (p. 15.) The lowest *horizontal* series of squares marked "unvaccinated" shows this. The outline of the original percentages with which we start at "0—9 years" is retained in the subsequent squares by a black line for the "copious," and a white line for the "confluent." In the same way the "drift" of the disease with age is made apparent in all the diagrams.

III. *The influence of vaccination on the extent of the eruption diminishes as the age increases.* (p. 15.)

IV. *The influence of a "good" vaccination is very stable, and of a "bad" very unstable.* Indeed, until we get above 30, the "drift" of those having a "good v. m." does not exceed in amount what is due to age as seen in the unvaccinated ; but then those having a "bad v. m." have almost reverted to the proportions of the unvaccinated. (p. 16.)

The two upper series of squares display all this. Taking those under "30—39 years," it is evident, in the first place, looking to the white and black lines, which represent the percentages at "0—9 years," that the "drift" in the unvaccinated is least, and in those with a "bad v. m." greatest. In the latter the black squares have swallowed up even those which were simply crossed, and have invaded the blank or "rare" squares. The eye at once recognizes the gradual assimilation of the squares representing the "bad v. m." to the squares representing the "unvaccinated." Equally readily will a glance show the extreme stability of a "good v. m."

THE

GLASGOW MEDICAL JOURNAL.

November, 1872.

Original Articles.

I.—A STUDY OF 972 CASES OF SMALL-POX, WITH REFERENCE TO THE MODIFYING INFLUENCE OF VACCINATION.

By JAMES B. RUSSELL, M.D., F.F.P.S.G., *Physician-Superintendent of Hospitals to the Board of Police of Glasgow.*

(With Diagram.)

It is of great importance to keep clearly in mind that vaccination is a *process*, and not merely an *operation*, as regards the individual. Though the operation may be performed to-day, the person operated upon is not really vaccinated until some days have elapsed. Hence it is *prima facie* absurd to propose vaccination as a mode of *treatment* of small-pox, or to use vaccine lymph as a medicine or antidote in actual small-pox. It would be equally reasonable to inoculate a person in whom natural small-pox was already active. Vaccination and re-vaccination must be practised as a process through which the system must pass, requiring time for its completion, and therefore to be begun without a moment's hesitation where the system is unprotected, or where it is well to renew the protection.

After closely observing over 1000 cases of small-pox in Hospital, I have become deeply impressed with the helplessness of medicine when face to face with the unmodified

disease. In this sense the only successful mode of treating small-pox is by vaccination. To take firm hold of its efficacy and necessity, and enforce their convictions in practice without wavering, is the most useful, almost the only useful action the medical profession can adopt against variola. When a case presents itself the first question in prognosis is regarding vaccination, although then the chief work of vaccination has been done, inasmuch as the only other circumstance in the patient's condition which is worth mentioning as affecting the prospects of recovery is the extent of the eruption, which I shall show is the direction in which post-vaccinal small-pox is chiefly modified. If *vaccinated*, then the attitude is one of hope that the disease may be cut short, however bad present appearances are, though, in fact, the probability is that the symptoms are from the first trivial. If *unvaccinated*, then the attack will probably be severe, the eruption copious or confluent, and we recognise a virulence and deep constitutional disturbance against which the resources of medicine are powerless. As regards the individual, the opportunity for medical interference is past, and we can only turn his case to profit by following on those about him the practice from the neglect of which he suffers.

I find that the mortality among my unvaccinated cases was 30 per cent.; among my vaccinated cases 9 per cent. (1) Therefore by vaccination in childhood the lives of the unvaccinated would have been transferred from a risk of 30 per cent. to one of 9 per cent. (2) But from the statements of the patients or their friends I found that about 60 per cent. of the unvaccinated and 50 per cent. of the vaccinated knew that they were exposed to the contagion of small-pox. Therefore, exactly that proportion had, on their own showing, had a clear chance of obtaining protection by primary and secondary vaccination. (3) Above a half of these cases of small-pox were avoidable; but when we consider that every case has a goodly lineage of cases derived from it, we may safely say that, mild as the epidemic was in Glasgow, it might with ease have been reduced to a third of its extent, and by a much larger proportion of its mortality by the

prompt use of demonstrated means of prevention. And when we speak of *small-pox as preventible*, we must remember that we use the word in a much more exact sense than when, in the present state of our knowledge, we speak of *typhus or cholera being preventible*. The latter are preventible as the ignition of a dress is preventible by caution, while small-pox is preventible as ignition is preventible by making the fabric of the dress non-combustible.

Being convinced, then, that recent small-pox experience can be turned to public advantage only in so far as it can be made to teach the public the benefits of vaccination, and knowing also that, in reference to the phenomena of small-pox after vaccination the profession are still necessarily only collecting facts, I have made a special study of the statistics of 972 cases of small-pox so as to forward those ends. This number includes all the cases admitted to the City of Glasgow Fever (Small-pox) Hospital, Parliamentary Road, from 1st January, 1871, to 30th April, 1872. Previous to the former date only 11 cases were admitted, and, excepting a few treated at Barnhill Poorhouse, my remarks embrace the entire hospital experience of small-pox in Glasgow up to the latter date.

TABLE I.

| Age. | Total Treated. | | Vaccinated. | | | | Unvaccinated. | | | | Odd Cases. | |
|----------------------------|----------------|-------------|----------------|----------|-------------------------|------------|-----------------|------------|-----------------------------|----------|------------|--------|
| | | | V. M. Visible. | | Said to be, but no V.M. | | Admitted to be. | | No information and no V. M. | | | |
| | T. | D. | T. | D. | T. | D. | T. | D. | T. | D. | T. | D. |
| 0—4 | 39 | 11 | 6 | — | 1 | — | 30 | 11 | — | — | 2 | — |
| 5—9 | 142 | 21 | 71 | 1 | 4 | 2 | 50 | 15 | 13 | 3 | 4 | — |
| 10—19 | 343 | 30 | 228 | 10 | 15 | 1 | 95 | 19 | 3 | — | 2 | — |
| 20—29 | 337 | 53 | 233 | 20 | 16 | 3 | 76 | 29 | 7 | — | 5 | 1 |
| 30—39 | 78 | 22 | 59 | 9 | 5 | 4 | 14 | 9 | — | — | — | — |
| 40—49 | 20 | 9 | 15 | 6 | 4 | 3 | — | — | — | — | 1 | — |
| 50—59 | 8 | 1 | 6 | 1 | 1 | — | 1 | — | — | — | — | — |
| 60— | 5 | 3 | 5 | 3 | — | — | — | — | — | — | — | — |
| All Ages, Per Centages, | 972 — | 150 15·4 | 623 — | 50 8· | 46 — | 13 28·2 | 266 — | 83 31·2 | 23 — | 3 13· | 14 — | 1 — |

METHOD OF RECORDING AND CLASSIFYING CASES.

Table I. shows those 972 cases as primarily classified with reference to vaccination, and distributed in decennial periods of age. Under this head I shall explain the principle of classification of the cases which form the subject of my remarks, and the precautions taken to insure the accuracy of my facts.

(1.) *As to Vaccination.*—If the vaccination-marks were visible, then their *number* and *quality* were noted. The quality was determined according to the standard described in my paper on “Re-Vaccination,” in this *Journal*, May, 1871. In the ward journals the quality is described as “very good,” “good,” “indifferent,” “bad,” “very bad;” but in my tables I have reduced those degrees to two, viz., “good” and “bad.” Sometimes persons were said to be vaccinated, but no marks could be seen, very frequently because of the abundance of the eruption. In some of those cases which recovered, an inspection before dismissal discovered vaccine marks, sometimes “very good.” Those who died, or who were not so examined, are placed in a separate column as “said to be vaccinated, but v.m. not visible.” I do not observe in the Reports on Small-pox, as observed in London and Dublin, any allusion to this difficulty. Even the best vaccine mark is readily obscured, or even hidden, by a copious eruption, and unless such special means as I have described are adopted, it is impossible accurately to ascertain the facts of small-pox in the vaccinated. Under “unvaccinated” also there is a separate column in this table, containing those regarding whom no information could be got, but on whose persons no marks were visible, usually not because of the abundant eruption, but because there were really none. These were no doubt unvaccinated, and are so reckoned for the objects of this paper. A few cases of a second attack of small-pox, also of small-pox modified by recent primary vaccination, are classified simply as “odd cases.”

(2.) *The extent of eruption* formed another subject of methodical observation. The descriptive terms employed in the ward journals were “rare,” “sparse,” “copious,” “semi-confluent,” “confluent,” “hæmorrhagic.” These are all

reduced to three categories in this paper, viz.:—the “rare,” “copious,” and “confluent.”*

INFLUENCE OF VACCINATION ON MORTALITY.

General Mortality.—Of the 972 cases under review, 150, or 15·4 per cent., died. Of these, 669 were vaccinated, and 63 of that number died, or 9·4 per cent.; 289 were unvaccinated, and 86 of that number died, or 29·75 per cent. The remainder are classified as “odd cases,” 14 in number, with one death. As already stated, therefore, the fact of vaccination, without further refinement, reduced the mortality to less than a third.

Influence of Age and Sex on Mortality.—It is obviously well to gauge the amount of other influences which may interfere with our conclusions as to the influence of vaccination. The only ones which seem to demand special inquiry are age and sex, the effects of which are exhibited in the following Table:—

TABLE II.

| Age. | VACCINATED. | | | | | | | | | UNVACCINATED. | | | | | | | | |
|--------|-------------|----|------|---------|----|------|--------|----|------|---------------|----|------|---------|----|------|--------|----|-------|
| | Male. | | | Female. | | | Total. | | | Male. | | | Female. | | | Total. | | |
| | T. | D. | % | T. | D. | % | T. | D. | % | T. | D. | % | T. | D. | % | T. | D. | % |
| 0—4 | 5 | — | — | 2 | — | — | 7 | — | — | 15 | 4 | 26·6 | 15 | 7 | 46·6 | 30 | 11 | 36·6 |
| 5—9 | 36 | 3 | 8·3 | 39 | — | — | 75 | 3 | 4 | 39 | 12 | 30·7 | 24 | 6 | 25· | 63 | 18 | 28·5 |
| 10—19 | 123 | 6 | 4·8 | 120 | 5 | 4·1 | 243 | 11 | 4·5 | 57 | 10 | 17·5 | 41 | 9 | 22· | 98 | 19 | 19·4 |
| 20—29 | 173 | 18 | 10·4 | 76 | 5 | 6·6 | 249 | 23 | 9·2 | 69 | 28 | 40·6 | 14 | 1 | 7·1 | 83 | 29 | 35· |
| 30—39 | 42 | 12 | 28·5 | 22 | 1 | 4·5 | 64 | 13 | 20·3 | 11 | 7 | 63·6 | 3 | 2 | 66·6 | 14 | 9 | 64·3 |
| 40— | 19 | 9 | 47·3 | 12 | 4 | 33·3 | 31 | 13 | 42 | 1 | — | — | — | — | — | 1 | — | — |
| Total, | 398 | 48 | 12· | 271 | 15 | 5·5 | 669 | 63 | 9·4 | 192 | 61 | 31·7 | 97 | 25 | 25·7 | 289 | 86 | 29·75 |

The facts of the table are so obvious as to require but little elucidation. The relative fatality in the sexes is

* The application of those terms to the cases was, for the most part, either originally made, or, at least, subsequently reviewed by me. My assistants were thoroughly versed in the principles of my classification, so that the distinctions indicated, both as to vaccine marks and eruption, are not fictitious or capricious, but real and uniform.

The completeness of my paper has been much impaired by the loss of one of the ward journals, which has inexplicably disappeared. It contained the record of about 140 cases, the want of the data concerning which causes *lacunæ valde defendæ* in all my tables.

striking, especially among the vaccinated, and at all the ages. These figures are too limited to admit of generalization; but, from the immense field of induction afforded by the statistics of the "Metropolitan Asylum District," which show the same contrast, but in a much less marked degree, I believe it merely to be an illustration of the common law of all epidemic diseases, and that the explanation simply is, that men are more weighted in the race than women through more rapid deterioration of staying power, partly from necessary toils and anxieties, and partly from more irregular habits.

Quality and Number of Vaccine Marks in Relation to Mortality.—It is evident that, in so far as the success of the operation of vaccination is indicated by the *quality* of the vaccine mark—*i.e.*, of the local traces left upon the skin—we should expect to find some relation between the quality of the vaccine mark and the protective influence, as tested by subsequent events. If the operation has been successful, and if we can decide, long after its performance, that it has been so from the local traces left, then we ought to find that, in a vaccinated community uniformly exposed to variculous contagion, the proportion of those with good marks of vaccination who are attacked is much less than the proportion of those having bad. From the nature of the case, there are insuperable practical difficulties in the way of proving this, except very indirectly; but the *protecting* influence of vaccination becomes, in those who do take small-pox, a *modifying* influence, and can thus be submitted to various methods of measurement as to nature and duration. We have the unmodified disease, as found in those who have never been vaccinated, as a standard, and the extent to which the phenomena of small-pox, after vaccination, deviate from this standard, may be made the subject of exact investigation.*

* Those who are acquainted with the literature of vaccination will not require to be told that all I aim at in this paper is to confirm, and perhaps more vividly illustrate, Marson's paper, originally published in the *Med. Chirurgical Transactions*, Vol. XXXVI. I am not aware of any previous systematic confirmation of his results; and I have elaborated the relation of vaccination to extent of eruption perhaps more than Mr Marson.

Vaccine marks may be considered as to quality or number simply, or as to number and quality combined, and the modifying influence may be exhibited and estimated in the mortality or in the extent of the eruption. We are at present looking for it in the *mortality*.

As to *Quality* simply, the following table shows that of 335 persons having "good" marks, 13, or 3·8 per cent. died, while of 156 persons having "bad" marks, 33, or 21 per cent. died. The contrast is apparent at all periods of life; but rises steadily from a minimum in the earliest to a maximum at the latest periods. The mortality of our 289 unvaccinated having been 29·75 per cent., it is evident that badly vaccinated persons are in the aggregate not much better protected from a fatal result than unvaccinated; and looking to the age, the badly vaccinated approach the unprotected condition more and more nearly as they become older.

TABLE III.

| Age. | Total. | | "Good" v. m. | | | "Bad" v. m. | | | Quality of v. m. not noted. | |
|-----------|--------|----|--------------|----|------|-------------|----|------|-----------------------------|----|
| | T. | D. | T. | D. | % | T. | D. | % | T. | D. |
| 0—4 | 6 | — | 1 | — | — | 2 | — | — | 3 | — |
| 5—9 | 71 | 1 | 34 | — | — | 11 | — | — | 26 | 1 |
| 10—19 | 228 | 10 | 134 | 5 | 3·7 | 50 | 4 | 8· | 44 | 1 |
| 20—29 | 233 | 20 | 123 | 5 | 4· | 64 | 13 | 20·3 | 46 | 2 |
| 30—39 | 59 | 9 | 32 | 2 | 6·2 | 17 | 7 | 41· | 10 | — |
| 40 | 26 | 10 | 11 | 1 | 9· | 12 | 9 | 75· | 3 | — |
| All Ages, | 623 | 50 | 335 | 13 | 3·81 | 156 | 33 | 21·1 | 132 | 4 |

As to *Number* simply, 491 cases were observed, of whom 46 had died, and it was found that of 313 persons who had only 1 mark, 32 died, or 10 per cent.; of 161 persons who had 2 marks, 14 died, or 8·7 per cent.; while of 14 persons who had 3 marks, of 2 who had 4 marks, and of 1 who had 8 marks, none died.

As to *Number and Quality combined*, when so far subdivided the data at my disposal are insufficient to warrant any conclusion. The preceding facts as to number of vaccine

marks, *without regard to quality*, point to no practical conclusion excepting this, that by introducing vaccine matter into several places on the child's arm you are more likely to be successful than by introducing it at one only, on the principle which leads a bad marksman to throw a handful of stones instead of one. There can be no doubt that quality is of more importance than number, that it is better to have one really good mark than several bad ones, and that the vaccinator should endeavour to succeed in one or two spots, rather than carelessly to insert his lymph in half-a-dozen.

I must confess that, led by the analogy of fevers and other infectious diseases, in which a mild attack, so far as we know, is as protective as a severe one, and on the general principle that the production of a constitutional effect, and not the amount of the specific poison which produces that effect, is the important factor in conferring constitutional immunity, I made my observations with the expectation that quality of mark alone would prove to be of importance. That is to say, I thought that one good mark must be as protective as several. While, undoubtedly, quality is of much greater value than mere number; while a person with one good mark and two bad marks cannot be supposed to be better off than one with one good mark only, nor can any number of bad marks give better ground for confidence than one, except on the rough principle already alluded to, still there are evidences that, in producing the constitutional effect of vaccination, the quantity of the specific poison introduced does bear some relation to the extent of immunity conferred. In coming to this conclusion, I have in my mind the elaborate observations made by Mr Marson on numbers sufficient to make his results worthy of notice; and the confirmation of those results, furnished by the experience of the Homerton and Stockwell Hospitals of the Metropolitan Asylum Board, during the recent epidemic of small-pox. These latter are that of 632 persons having one good mark, 5·3 per cent. died; of 674 having two good marks, 4·1 died; of 301 having three good marks, 2·3 died; and of 259 having four, or more,

good marks, only 1·1 died. My own cases showed that, of 191 persons having one good mark, eight died, or 4·2 per cent.; while, of 130 having two good marks, five died, or 3·8 per cent.; and of 13 persons having three good marks, and one having four, none died. My observations, therefore, coincide with those quoted. -

The real meaning of these facts seems to me to be, that *the quantity of a specific poison has something to do with the immunity conferred by the constitutional infection*. The number of vaccine marks can have no meaning, excepting in so far as they indicate in a general way the quantity of lymph introduced into the system. It cannot be that the *same quantity of lymph*, introduced into four spots successfully, confers more immunity than if introduced into one spot successfully, or that, by dividing a cicatrix into four, its protective value is increased. Hence, I am inclined to think that the local and permanent phenomenon which would best indicate the quantity of lymph introduced, and consequently show even more striking relations to the mortality, would be the *superficial area* of good vaccine cicatrices. It seems evident, from Marson's description of his mode of vaccination, that he would produce five good vaccine marks, whose united area would probably little exceed that of one vaccine mark such as is left by the operation as practised at our public vaccine stations in Glasgow. The data for establishing my conjecture as to the area could not be obtained without immense trouble. Still I think the residuum of these observations is this, and it is of great importance in relation to the general etiology of diseases propagated by specific poisons, that the *quantity of vaccine virus absorbed regulates the duration and thoroughness of the constitutional immunity from small-pox conferred*.

INFLUENCE OF EXTENT OF ERUPTION ON MORTALITY.

A rate of mortality indicates not only the fact of the death of certain individuals, but also the fact of the risk run by those who did not die. A greater percentage of mortality therefore indicates that the persons making up the centum ran a greater risk of death. To measure and exhibit this

risk is of importance, but cannot always be done. In typhus I have employed, as a general indication of the fact, as well as a means of estimating it, the proportion of patients stimulated, which rises and falls with the mortality. In small-pox we obtain a better measurement of risk by classifying patients according to the extent of the eruption. The risk of life is almost absolutely in proportion to the extent of the eruption. By testing the effects of vaccination as shown in the proportion of persons having a certain extent of eruption, we shall not only demonstrate a very important clinical fact, but, by appealing to a much wider basis of induction than mere mortality affords, we shall lessen the risk of error, and also bring out in greater relief what may be only faintly shown in the preceding pages.

Mortality from Small-pox directly proportioned to the extent of the eruption.—In the following table the vaccinated and unvaccinated cases are arranged in three categories, according as the eruption was “rare,” “copious,” or “confluent”:—

TABLE IV. a.

| AGE. | VACCINATED. | | | | | | UNVACCINATED. | | | | | |
|--------------|-------------|-----|----------|------|--------|-----|---------------|-----|----------|------|--------|-----|
| | Rare. | | Copious. | | Confl. | | Rare. | | Copious. | | Confl. | |
| | T. | D. | T. | D. | T. | D. | T. | D. | T. | D. | T. | D. |
| C—9 | 44 | ... | 12 | 2 | 1 | ... | 12 | ... | 35 | 6 | 29 | 19 |
| 10—19 | 133 | 1 | 54 | ... | 17 | 9 | 12 | ... | 34 | 3 | 39 | 13 |
| 20—29 | 125 | ... | 67 | 5 | 29 | 17 | 8 | ... | 31 | 3 | 40 | 25 |
| 30—39 | 22 | ... | 20 | ... | 14 | 13 | 1 | ... | 4 | 1 | 8 | 7 |
| 40— | 11 | ... | 7 | 3 | 10 | 10 | 1 | ... | ... | ... | ... | ... |
| All ages, | 335 | 1 | 160 | 10 | 71 | 49 | 34 | ... | 104 | 13 | 116 | 64 |
| Per centage, | | | | 6.25 | | 69. | | | | 12.5 | | 55. |

The result is that only one death took place among those having a “rare” eruption, whether vaccinated or unvaccinated. On referring to the Journal of the Ward, I find that

this death was not in any way connected with small-pox. The patient had chronic cardiac disease, and, after having been walking about for above a week, died suddenly. We may therefore say that *no person having a "rare" eruption dies from small-pox, whether vaccinated or unvaccinated.*

Of those having a "copious" eruption, among the vaccinated 6 per cent., among the unvaccinated 12 per cent. died. Of those having a "confluent" eruption, among the vaccinated 69 per cent., among the unvaccinated 55 per cent. died.* No remarks are required to prove from these statistics that the gravity of a case of small-pox depends very directly on the extent of the eruption.

INFLUENCE OF VACCINATION ON EXTENT OF ERUPTION.

Vaccination influences the fatality of Small-pox by diminishing the original extent, as well as occasionally checking the subsequent course of the eruption. (See Diagram.) The relative proportion per centum of the three degrees of eruption in natural small-pox, *i.e.*, in the unvaccinated, was this:—*Of 254 unvaccinated persons,*

| | | |
|----|-----------|------------------------|
| 13 | per cent. | had a "rare" eruption. |
| 41 | do. | do. "copious" do. |
| 46 | do. | do. "confluent" do. |

On the other hand, the proportion per centum of the three degrees of eruption in modified small-pox, *i.e.*, in vaccinated cases, as shown in the last table, is this:—*Of 566 vaccinated persons,*

| | | |
|----|-----------|------------------------|
| 59 | per cent. | had a "rare" eruption. |
| 29 | do. | do. "copious" do. |
| 12 | do. | do. "confluent" do. |

So that the proportions are more than reversed. While *unvaccinated* people are liable to "confluent" or fatal small-pox, in the proportion of 46 per cent. of those attacked, 59 per cent. of the *vaccinated* who are attacked, take the "rare," or non-fatal form of the disease.

We have spoken of "good" and "bad" vaccination. Any effect which we suppose vaccination to have, ought to

* This predominance of fatality among the *vaccinated* "confluent" cases does not affect our present line of inquiry, but it evidently arises, at any rate in part, from the average age of the vaccinated being much higher.

be very decidedly influenced by its quality. That such is the case is shown in this table.

TABLE V.—a.

| AGE. | GOOD. | | | BAD. | | | Quality not noted. | Total Observed. |
|--------|-------|----------|--------|-------|----------|--------|--------------------|-----------------|
| | Rare. | Copious. | Confl. | Rare. | Copious. | Confl. | | |
| 0-9 | 30 | 5 | — | 10 | 1 | 1 | 1 | 48 |
| 10-19 | 103 | 24 | 5 | 21 | 20 | 7 | 4 | 184 |
| 20-29 | 87 | 29 | 5 | 21 | 25 | 17 | 3 | 187 |
| 30-39 | 17 | 13 | 2 | 3 | 6 | 8 | — | 49 |
| 40- | 8 | | 1 | 1 | 4 | 7 | 1 | 23 |
| TOTAL, | 245 | 72 | 13 | 56 | 56 | 40 | 9 | 491 |

The relative proportion per centum of the three degrees of eruption in small-pox found in persons who had “good” and “bad” vaccine marks was this, therefore:—*Of 330 persons having good marks,*

74 per cent. had a “rare” eruption.

22 do. do. “copious” do.

4 do. do. “confluent” do.

While, *of 152 persons having “bad” marks,*

37 per cent. had a “rare” eruption.

37 do. do. “copious” do.

26 do. do. “confluent” do.

We may bring the three gradations of proportions of eruption together as follows, so that at a glance it may be seen how vaccination tends, by reducing the original amount of eruption, to render small-pox innocuous to life:—

“Rare.” “Copious.” “Confluent.”

Good v. M. 74 per cent. 22 per cent. 4 per cent.

Bad v. M. 37 do. 37 do. 26 do.

Unvaccinated, 13 do. 41 do. 46 do.

The influence of Vaccination on the extent of the eruption diminishes as the age increases. (See Diagram).

It is necessary first to determine *what is the influence of age on the extent of eruption in the natural disease.* This is shown in the following table, in which the actual numbers given in Table IV.-a are reduced to per centages of the whole number treated at each decennial period of age:—

TABLE IV.—b.

| AGE. | UNVACCINATED. | | | VACCINATED. | | |
|-----------|---------------|----------|--------|-------------|----------|--------|
| | Rare. | Copious. | Confl. | Rare. | Copious. | Confl. |
| 0—9 | 16 | 46 | 38 | 77 | 21 | 2 |
| 10—14 | 14 | 40 | 46 | 65 | 27 | 8 |
| 20—29 | 10 | 39 | 51 | 57 | 30 | 13 |
| 30—39 | 8 | 31 | 61 | 39 | 36 | 25 |
| 40— | | | | 39 | 25 | 36 |
| ALL AGES, | 13 | 41 | 46 | 59 | 29 | 12 |

From this table it is evident that age alone, or age with, the usual average deteriorating influences of vice, hardship, &c., has a decided influence even in the natural disease on the extent of the eruption, and that influence is in the direction of increasing the tendency to confluence. In other words, the older an unvaccinated person is, the more risk he runs of having the confluent or fatal form of the disease. Thus, while the proportions per cent. of “rare,” “copious,” and “confluent” cases are, during the first ten years of life, respectively 16, 46, and 38; during the ten years between thirty and forty, they are 8, 31 and 61, with an intervening gradation. The question, therefore, is, whether vaccinated persons show a *greater* “drift” than the unvaccinated in the direction of confluence.

That in the vaccinated there is a very decided “drift” in this direction, is evident from the second half of the last table, in which decennial per centages of the vaccinated also are given. Starting with a proportion of “rare,” “copious,” and “confluent” cases during the first ten years of life, of 77, 21, and 2 per cent. respectively, we reach between thirty and forty years a proportion of 39, 36, and 25 per cent., with intervening gradations. That in the vaccinated there is also a very much *greater* “drift” towards confluence than in the unvaccinated, will be manifest from the following table, in which I have taken the per centages of the first decennial period as the standard, and have entered at each subsequent period the difference between its per centages and those of the preceding, using a *plus* or a *minus* sign, according as the difference is an increase or a

diminution. In this way, at each decennial period after the first, we can see the exact amount of change, or “drift,” as I have called it, in the distribution of the per centages as compared with the previous period.

TABLE IV.—c.

| AGE. | UNVACCINATED. | | | VACCINATED. | | |
|-------|---------------|----------|--------|-------------|----------|--------|
| | Rare. | Copious. | Confl. | Rare. | Copious. | Confl. |
| 0—9 | 16 | 46 | 38 | 77 | 21 | 2 |
| 10—19 | —2 | —6 | +8 | —12 | +6 | +6 |
| 20—29 | —4 | —1 | +5 | —8 | +3 | +5 |
| 30—39 | —2 | —8 | +10 | —18 | +6 | +12 |

So that, while in the successive decennial periods after the first the “drift” towards confluence in the *unvaccinated* shows itself in a falling off of 2, 4, and 2 from the per centage of “rare” eruption, in the *vaccinated* the falling off is 12, 8, and 18. Still it will be noticed that the “drift” for the most part only goes the length of transferring the “rare” into the “copious” in the vaccinated, while in the unvaccinated it ends entirely in an addition to the “confluent.”

The *quality* of the vaccine mark may be here again employed as a test of the accuracy of those conclusions. If the modifying influence of vaccination diminishes as the age increases, then it ought to diminish more rapidly in those who are badly vaccinated than in those who are well vaccinated. The following table is made up, on the principle already described, of per centages derived from the actual numbers in Table V.—a:—

TABLE V.—b.

| Age. | “GOOD.” | | | “BAD.” | | |
|-----------|---------|----------|--------|--------|----------|--------|
| | Rare. | Copious. | Confl. | Rare. | Copious. | Confl. |
| 0—9 | 86 | 14 | — | 84 | 8 | 8 |
| 10—19 | 78 | 18 | 4 | 44 | 42 | 14 |
| 20—29 | 72 | 24 | 4 | 33 | 40 | 27 |
| 30—39 | 53 | 41 | 6 | 18 | 35 | 47 |
| 40— | 80 | 10 | 10 | 9 | 33 | 58 |
| All Ages, | 74 | 22 | 4 | 37 | 37 | 26 |

During the first decennial period the per centages of the three degrees of eruption are much alike both in the well and in the badly vaccinated, being 84, 8, 8 in the badly, as against 86, 14, 0 in the well vaccinated; but while between 30 and 40 years of age the badly vaccinated have reverted so nearly to the condition of the unvaccinated as to present a per centage proportion of 18, 35, and 47, the well vaccinated still maintain the proportion of 53, 41, and 6 of “rare,” “copious,” and “confluent” cases respectively.

It is scarcely necessary to gauge the comparative amount of this “drift,” except to contrast and exhibit to the eye *the stability of effect of a good vaccination and the rapidly fading effect of a bad one.* (See Diagram). This the following Table, constructed from the preceding in the manner already described, does very clearly:—

TABLE V.—c.

| Age. | “GOOD.” | | | “BAD.” | | |
|-------|---------|----------|--------|--------|----------|--------|
| | Rare. | Copious. | Confl. | Rare. | Copious. | Confl. |
| 0—9 | 86 | 14 | — | 84 | 8 | 8 |
| 10—19 | — 8 | + 4 | + 4 | —40 | + 34 | + 6 |
| 20—29 | — 6 | + 6 | — | —11 | — 2 | + 13 |
| 30—39 | —19 | + 17 | + 2 | —15 | — 5 | + 20 |

It may be said that in well-vaccinated persons the amount of the “drift” towards confluence is not greater than age alone would explain until we get above 30 years of age. The badly vaccinated, on the other hand, show excessive instability, and the “drift” above 20 years tends to increase the “confluent” cases at the expense both of the “rare” and the “copious.” There are therefore three degrees of “drift” increasing with age—

- 1st. *The natural “drift,”* as seen in the unvaccinated, which is least.
- 2nd. *The “drift,”* as seen in the well vaccinated, which is not greater than the natural drift until we pass the age of 20.
- 3rd. *The “drift,”* as seen in the badly vaccinated, which is greater than the natural drift at all ages.

It must be remembered, when we speak of the tendency towards confluence increasing with age in the vaccinated in greater proportion than in those who have the natural disease, that in the vaccinated we set out so to speak from a higher level, and, therefore, have farther to decline. The proportions of "rare," "copious," and "confluent" cases seen in the natural disease, in the first decennial period of age, are exactly reversed in the vaccinated. Therefore, this greater "drift" in the vaccinated is, in reality, the tendency of small-pox to revert to its natural type. In short, the ultimate issue of this inquiry is to demonstrate, almost to express in exact terms, what I believe to be the fact, that *in the aggregate the influence of vaccination is unstable*. We cannot prove this by finding the proportion of the vaccinated living at each decennial period, who, being equally exposed, will take small-pox; but in those at each decennial period, who have taken small-pox, we can find evidence that, as you recede from the point of vaccination, the disease tends to emancipate itself from the modifying power of the vaccination, and to revert to its original type. In other words, the constitutional insusceptibility gradually fades. At the same time, it is of the greatest practical importance to remember *how very stable in its effects vaccination may be made by care in the performance of it*. While variola very speedily throws off the modifying influence of a "bad" vaccination, it remains subject to the influence of a "good" vaccination to the latest periods of life. We may be sure that the protective follows the same law as the modifying power. Still, these facts derived from averages furnish no argument against the re-vaccination, especially in the face of known exposure to contagion, even of those persons who present evidences of perfect primary vaccination. "It is very well for us to know that one person under inspection, of a certain age, with certain marks, runs so much less risk of proving to be susceptible when exposed to small-pox than this other person. But so long as we cannot say, you are the individual who will escape, we have no right to leave him even to this diminished risk." *

* See my paper "On Re-Vaccination," in this *Journal* for May, 1871.

II.—CASE OF WOUND OF THE ABDOMEN AND OF PROTRUDED INTESTINE—RECOVERY, WITH REMARKS.

By EBEN. WATSON, M.D., *Professor of Physiology in Anderson's University; Surgeon and Clinical Lecturer on Surgery, Royal Infirmary, Glasgow, &c.*

WOUNDS of the abdomen and of its contained organs are so rare in civil practice, except when inflicted by the surgeon himself, that I think the following case will be interesting to all, and perhaps instructive to some of the readers of this journal. For the sake of brevity, I give the history of the case in a consecutive manner, as I now know it occurred, and not as its various circumstances first came to my knowledge:—

The subject of the injury was a lad of 15, stout, and well built, who had shortly before eaten an unusually large meal of meat and vegetables, followed by some ale and whisky.

On the evening of the 28th Sept. last, when this lad was standing on the street, he was stabbed in the abdomen by a man with whom he had had some quarrel. Exactly at 9.50 P.M. on that evening he was taken to the surgery of Dr Simson Buchanan, who informs me that he found a large protrusion of bowel through a very small wound in the abdomen, and, perceiving it to be a very serious case, ordered his immediate removal to the Infirmary. Dr Buchanan did not attempt reduction of the bowel, but wrapped it in warm flannel, and saw him placed in a cab. He arrived in the Infirmary about 10.15, and his state at that time is described as follows by Mr Napier, my house surgeon:—

On admission, it was seen that he was in a drowsy and half-unconscious state, this being caused by some whisky that he had taken that day, as he himself afterwards confessed. He was very weak, his surface was pale and cold; pulse was 68, and so feeble as to be almost imperceptible. He complained of very little pain, and that only at the point of injury, and when the parts were handled. On examination it was found that, from a wound in lower part of left side of abdomen, a large portion of small intestine and mesentery were protruding, arranged in festoons, so as to hide the

aperture of exit from the abdominal cavity. The length of the protruded part was not accurately determined, but those present thought that two feet would be about the measurement. Dr Buchanan thought fully three feet of bowel was protruded. The bowel was highly congested, and bleeding profusely at one point. There was no dust or dirt of any sort adhering to the surface of the bowel. Close to the bleeding point there was found an incised wound of the bowel, penetrating all its coats, and running transversely to its axis. It was straight, sharp at each end, clearly cut, rather over half an inch in length, passing from the free border of the bowel to the attachment of the mesentery. From this wound issued several gushes of dark-coloured fluid, and some creamy-looking intestinal matters. The opening in abdominal wall was tightly closed up by the parts lying in it.

The steps necessary for the reduction of the protruded mass were taken at once by the house surgeon, while I was being sent for, as it was thought expedient that the parts should be restored to their natural position as soon as possible.

As the patient was struggling and rolling about, he was first put fully under the influence of chloroform. The branch of mesenteric vein, lying at inner end of wound, and from which the hæmorrhage, already mentioned, was proceeding, was then tied with the antiseptic cat-gut. All bleeding having been stopped, the wound in the bowel was stitched in the following way:—The projecting mucous lining was carefully returned into the bowel, and the peritoneal edges accurately brought together by means of *four* interrupted sutures. The needle was put through the whole thickness of the bowel, and plenty of tissue was engaged in each stitch. The thread, which consisted of the thinnest prepared cat-gut, was cut close to each knot. The wounded part of the bowel was kept unreduced, but under a spray of carbolic acid solution, until I arrived and examined it. As the lips of the wound were well held together, I then carefully reduced the bowel through the

original wound in the abdominal wall, which was now for the first time distinctly seen. It was about $\frac{3}{4}$ of an inch long, sharp at each end, running vertically in the axis of the body, and was situated at two inches to left, and three inches below level, of umbilicus. This wound was left unstitched, and was merely covered with a small piece of oiled silk, and the antiseptic gauze placed over all. The whole was then carefully bandaged. From the time that the lad was first seen, till the completion of the dressing, the parts were kept surrounded by an antiseptic atmosphere of carbolic acid, by means of the spray apparatus.

Patient was now removed to a clean bed; and, as he was still only partially conscious, and suffering from shock, hot pans were put to his feet, plenty of bed-clothes were heaped on him, and $\frac{3}{4}$ ii. brandy were administered, in warm water. His knees were elevated by having a pillow put under them, after which he was left, instructions being given that he should be kept as quiet and undisturbed as possible.

Sept. 29th, 1 A.M.—Pulse 100, and getting stronger. Patient warmer, still drowsy, and not feeling much pain.

4 A.M.—Pulse 120, and still stronger. Patient warmer, drowsy, and with no pain except on pressure.

9.15 A.M.—Pulse 100, and of fair strength. Skin rather hotter than natural. He is quite tranquil and easy, and free from distress. He slept well last night, and has no pain except on moving. No tympanicity of abdomen. He has passed water, but bowels are not yet moved. His bowels were last opened two days ago (on 27th Sept.), and he states that he is of costive habit, frequently not having a motion for three days. 1 P.M.—Pulse 112.

10.40 P.M.—Pulse 80, and of ordinary strength; heat of skin natural. Patient is sleeping soundly; respiration not at all hurried. Abdomen quite lax. His diet to-day has consisted of milk and beef-tea, with an occasional drink of soda water. His deposition was taken this afternoon by the Sheriff; he bore the scene well, and did not seem much agitated.

Sept. 30th, 9.15 A.M.—Pulse 84; temperature, to hand,

about normal. He slept well last night, and is quite easy to-day. Tongue clean; abdomen soft; pain trifling. Wound dressed antiseptically, under the spray; it looks healthy. 10 P.M.—Pulse 62. No tympanicity of abdomen; bowels not yet moved. He has felt hungry to-day. Diet, still milk and beef-tea.

Oct. 1st, 9 A.M.—Pulse 72; tongue clean; appetite good; slept well; no pain. 9 P.M.—Pulse 58; sleeping soundly; skin cool. Patient is quite easy and lively, and would get out of bed if allowed; he occupies a bed near a window, and is constantly turning himself round to see out of it; to-day, too, the nurse found him with a pipe full of strong black tobacco, proceeding to smoke.

Oct. 2nd, 9 A.M.—Pulse 72. Heat of skin natural; slept well last night; tongue clean; appetite good; bowels not yet moved. No pain, or tympanicity of abdomen. Wound dressed this morning antiseptically: it is looking healthy. 10 P.M.—Pulse 56; skin cool. No pain. Bowels not yet opened, though he has passed much wind to-day.

3rd, 10 P.M.—Pulse 68; had a good day. Abdomen still continuing lax. He has felt an inclination all day to have a motion, but was directed not to press matters.

4th, 9 A.M.—Pulse 80. General condition of patient as favourable as possible. Bowels not yet moved. Wound dressed antiseptically; healing rapidly; discharge very trifling. 9 P.M.—Pulse 50. Sleeping soundly. Abdomen lax.

5th, 9 P.M.—Pulse 80; skin rather hot. He has had some slight pain near wound to-day, but this abated towards evening. Tongue clean. Abdomen still soft.

6th, 9 P.M. Pulse 82; skin cool; pain gone. Bowels not yet opened. Wound dressed antiseptically: it is healing, and there is almost no discharge.

7th, 9 A.M.—Pulse 64; slept well; has no pain. 9 P.M.—Pulse 56; skin cool; no pain; appetite good. To-day he again felt strong inclination to have a motion; bowels were not, however, opened, and he did not press.

8th, 9 A.M.—Pulse 60. 11 P.M.—Pulse 48. Patient is

sleeping soundly. General condition all that could be desired. Wound was dressed this morning; healing; discharge trifling.

9th, 9 P.M.—Pulse 56; no pain or tympanicity of abdomen; tongue clean; appetite good. *Bowels were to-day moved three times*; at first the motion was rather costive, but was afterwards quite normal. Porridge added to diet.

10th, 9 A.M.—Pulse 58; patient is quite easy and quiet, and has no pain. He had another natural motion of his bowels late last night. 11 P.M.—Pulse 48; no pain.

11th, 11 P.M.—Pulse 56. Bowels moved once to-day; motion quite natural. Wound dressed antiseptically; it is evidently superficial now, and healing; no discharge and no smell whatever.

12th, 9 P.M.—Pulse 60; patient quite easy. Bowels moved once to-day.

13th, 8 P.M.—Pulse 64; patient easy. Bowels moved once to-day.

14th, 10 P.M.—Pulse 66; no pain or any uneasiness. Bowels moved once to-day. Patient this evening wet the bed. There being reason to fear that if the urine soaked through the dressing it would interfere with its antiseptic character, everything was changed. The wound was looking very well, the granulations being almost too exuberant. No discharge.

21st.—Wound in abdominal wall may now be considered as healed. In all other respects the boy is perfectly well, but he is still kept in bed and on soft diet.

In the preceding case, I think it a point of some importance to make out, if possible, the manner in which the wound was inflicted. For it seems strange, in the first place, that so large a portion of bowel was protruded through so small an aperture in the abdominal wall, and also that the contents of the bowel did not at all escape into the peritoneal cavity. This last circumstance is inferred, first from the absence of any discharge from the abdomen on reduction of the bowel; and second, from the complete immunity from peritonitis which the patient enjoyed during the progress of the case to perfect recovery. Now, some

readers may be inclined to account for this non-escape of the intestinal contents by the bulging of the mucous membrane into the wound, and so plugging it up; but the wound was too large to be thus protected. It might also be supposed that the small bowel was at the time empty; but again this is unlikely from the time (about six hours) that had elapsed since a full meal of meat and vegetables had been taken. I am inclined to think that both circumstances, viz., the great protrusion of bowel through so small a wound of the abdominal wall, and the non-escape of the intestinal contents into the peritoneal cavity, are best accounted for by the supposition that the point of the knife was turned a little upwards after entering the bowel, and that it hooked the latter out through the internal wound. The contents of that part of the intestine may thus have escaped externally, while the tightness with which the external wound grasped it prevented more than its first contents from coming down to the injured part of the bowel. This hypothesis is rendered more probable, if what Dr Buchanan tells me of the bluntness of the knife with which the injury was inflicted turns out to be correct. It is supposed that the knife was held as a dagger in the hand of a man taller than the recipient of the blow, and that thus it naturally acted as a hook upon the loose and elastic bowel into which its point had entered.

It seems to me very fortunate that Dr Buchanan did not attempt reduction of the bowel at first, for it is obvious that in the hurry and discomfort in which he saw the boy he was not likely to have detected the wound in the intestine. If this had been replaced, therefore, in the abdominal cavity, escape of the contents most probably would have occurred to such an extent as to have greatly imperilled the life of the boy. Under his more prudent treatment, however, the bowel was kept warm and clean, while any discharge that could take place from it was innocently received in the flannel until the patient was placed in a hospital bed in a good light, and with plenty of assistance, and, above all, under chloroform, when the condition of parts was accurately made out, and as far as possible rectified. The bleeding vessel was tied, and the wound stitched, and then the bowel was deliberately returned

into the peritoneal cavity. But it is interesting to notice in passing that this was not done till the bowel had been exposed for more than an hour. For great part of this time indeed it had been surrounded by a spray of the solution of carbolic acid, and certain it is that it suffered no injury from the exposure. No peritonitis was excited.

I think that the method of closing the wound in the intestine is well worthy of remark; for, as far as I know, it is without precedent. Silk has generally been employed in stitching these wounds, but this must ulcerate through the tissues, and in successful cases, which have been very few, is supposed to have passed into the bowel. In my case prepared cat-gut was used as thread, and four stitches were inserted somewhat closely, so as accurately and firmly to close the gap. Now, these stitches would only retain their power for about twenty-four hours. They then soften, and dissolve in the fluids of the body, and are absorbed.

Instead, therefore, of the usual steps in the healing of such wounds, viz., the exudation of lymph around the stitches and over the wound, gluing it together, and forming a protective sheath, under cover of which the threads ulcerate their way into the calibre of the bowel, and finally the organization of the lymph into cicatricial substance rather on the outside than between the lips of the wound;—instead of all this, as my case well illustrates, the history of the process may now be given as follows. The lips of the wound are accurately placed, and kept in contact for twenty-four hours; then the stitches are withdrawn by a natural process, and primary union is found to have taken place. No doubt I am, as yet, unable to state, from actual observation, that all the intestinal coats are equally concerned in this union; but, from what I have elsewhere seen, I do believe that the union is at first solely accomplished through the medium of the areolar tissue and its modifications, the serous and mucous coats, and that more slowly, if at all, the muscular tissue is restored.

The object of this new practice is, in many respects, so different from that of the old, that it is hardly necessary to state that retaining ligatures in the external wound or using

any means to keep the injured part of the bowel near it are no longer necessary, and should be at once discarded from surgical practice, as more likely to do harm than good, I must, however, call attention to the fact that I used no stitch to hold the external wound together. Even had this wound been twice as long, I would still have used no stitch for it, because I believe that the greatest danger in all such wounds, whether inflicted by the surgeon or by others, arises from the retention of discharge within the peritoneal cavity or between the lips of the wound itself. In the case narrated above there was no discharge of any kind during the healing of wound; but if there had been, I should have held it to be very bad surgery, had I not in every way facilitated its escape. Hence the wound was left free, and only protected by carbolized dressings. The result has been a gradual and not by any means a slow progress towards cicatrization.

I need hardly add, in conclusion, that in all such cases an obvious advantage is obtained by restricting the patient's diet both as to quantity and quality; and this should not only be done for the first week or two, but it is very prudent to continue the restrictions of diet, as well as the confinement to bed, for a period at least twice as long as that mentioned; in fact, until the wounds, both external and internal, are thoroughly healed. This precaution is all the more necessary in cases treated like the preceding, in which no peritonitis, even of the most limited extent, occurred, and therefore no gluing of adjacent parts was to be trusted to for superadded strength. The result which I obtained in the preceding case, and which will, I hope, be obtained by others in similar circumstances, was much better than could have accrued from the induction of local peritonitis and its consequences. For the primary danger of the peritonitis becoming general was avoided, and the adventitious aid of its resultant false membrane was rendered unnecessary by the actual re-union of the divided coats of the bowel itself.

III.—CASES OF HYDROCEPHALUS TREATED WITH BROMIDE OF POTASSIUM.

By JOHN BRUNTON, M.A., M.D., L.F.P.S.G., &c., &c., Fellow and Councillor of the Obstetrical Society, London, &c., &c.

ACUTE hydrocephalus is one of the most serious diseases that can attack a child. One only requires to look over the statistics of this disease recorded in any of the standard works on the diseases of children to find ample proof of this fact. It is not my intention to enter into a discussion of the subject, but to make an addition to the many methods of treatment of this disease. Should this method find acceptance with others, and be successful, I shall have gained the end desired—the relief or cure of a hitherto very intractable disease, and added an item to our store of means for the aid of suffering humanity.

There is now under my care a child fifteen months old, of fair complexion, well formed, and which, up till the last fortnight, had enjoyed very good health. It had not ailed since its birth, in any way, until I was called to see it. Then I found it dull, listless, sleep disturbed, bowels irregular, motions nasty and slimy. Pulse 130, very irregular; skin hot, child very feverish, tongue furred, inclination for food or appetite irregular, and vomiting its milk occasionally. It had had no fits; teething was normal. It had walked at the age of 12½ months, but now it was quite “off its legs.” The mother told me that it had been gradually getting into this state for a few days before I saw it. On examination, I found, in addition to the above symptoms, that its head was very hot, often perspiring. The anterior and posterior fontanelles had not closed, but were large, open, pulsating, hot, distended, and (the anterior especially) standing up above the cranial arch. There was most decided enlargement of the whole head, giving the characteristic appearance of acute hydrocephalus.

I put this child on two grain doses of bromide of potassium, to be given every hour, with a diet of milk only. After the lapse of a week the child had visibly improved—was

gradually getting out of its listless condition, took its milk better, ceased to vomit, and began to recognise its mother. The pulse had become steadier, and the bowels acted in a more natural manner. There was a marked change in the appearance of the fontanelles, the great distension was relieved, and the child was decidedly more comfortable.

To-day, Oct. 18, 1872, on my visit, I found the child quite lively, in its mother's arms, bright and intelligent-looking, and instead of distension of the fontanelles there was slight depression. The general appearance of the head was quite altered and natural looking, while the other acute symptoms had all subsided. The bromide of potassium had been given steadily during the whole time. The mother's expression to me to-day, was, "My child is itself again,"—a great satisfaction to both of us. I shall now add citrate of quinine and iron to its mixture, and give small doses of cod-liver oil, under which treatment I have no doubt the cranial ossification will advance, be completed, and the result be cure.

Two years ago, I treated a similar case, F. S., a boy three years of age, with large head, of scrofulous habit of body. When I saw him his symptoms were much as described in the previous case. His head was very large. He had an unintelligent look. From his mother's account, and his evident appearance, he had chronic hydrocephalus in a very latent or inactive condition, but it was progressive. When I was called, acute symptoms had manifested themselves. I adopted the bromide of potassium treatment with perfect success, till the acute stage had passed, and then I gave bromide of potassium with quinine, iron, and cod liver oil. He made a very good and satisfactory recovery. He now is active, intelligent, and smart. A year afterwards, I delivered his mother of twins. One died of diarrhoea a month after birth, the other shortly manifested the constitutional taint; the head began to enlarge, with protrusion of the fontanelles, enlarged vessels on the outside of the head and scalp, and the other general symptoms of hydrocephalus. This child I treated in the same way as the others, with the same success. It is now alive, and thriving well.

In October, last year, I was called to see the child of Mrs S., then five months old. I found conditions as above described. This child is one of an unhealthy family. The mother had several still-born, decomposed children, with fibrinous disease of the placenta as the cause. The mother had been under treatment during pregnancy with this child, and though it was born alive, I had my doubts as to whether it would live long. Not contrary to my expectation I was, as I have said, called to it, when I found that hydrocephalic symptoms had set in. The same line of treatment was followed throughout, with similar success. I could mention several other cases, but I consider it unnecessary to do so, as they have all terminated equally favourably.

Now the question arises, Why did I treat those cases with bromide of potassium in preference to the methods laid down in our works on diseases of children? Because I have found as a rule that these methods have been with me very unsatisfactory, and I have been on the outlook for something better.

The *rationale* of my treatment is this, that in acute or chronic hydrocephalus there is a certain amount of irritation, or inflammation of the brain and its membranes; that, of course, with this irritation there is increased vascular (blood) supply; that the arteries carry more blood to the brain and its membranes than the veins are capable of returning; then the result is effusion and its products. It occurred to me that if I could give some medicine whose power consisted in diminishing the supply of blood to the head, I would thereby overcome the effusion itself, the continuance of that effusion, and the tendency thereto, and absorb the products. That medicine I believe to be the bromide of potassium, and the results, I think, bear out my idea.

Bromide of potassium has been given by many in order to produce sleep, and the theory of many, among whom I may mention my late lamented friend, Dr Hyde Salter of Charing Cross Hospital, is that sleep is produced by *diminished* supply of blood to the brain. I know that this theory has been questioned, yet I think that the bulk of evidence is in its favour.

Now, if I am correct in my theory, I trust that the few notes

I have given may be of service to others, and the treatment prove as successful in their hands as it has done in mine. In short,—reduce the blood supply, stop effusion, absorb the products of that effusion, tone the system, give it strength, and the result will be satisfactory.

IV.—TWO CASES OF INJURY TO THE ABDOMEN HAVING A PERIOD OF LATENCY, AND THEREAFTER PROVING RAPIDLY FATAL.

By WILLIAM M'EWEN, M.D., *Casualty Surgeon, Central District of Police, Glasgow.*

ON November 14th, 1871, James T., fourteen and a-half years of age, was run over by a vehicle, one wheel of which was said to have passed over his abdomen, in a line with the umbilicus, the other wheel over his right arm.

His right arm was found to be lacerated, and the muscles exposed and torn. After careful examination, no marks of injury could be detected on the trunk, and there was nothing to indicate that the wheel had passed over his abdomen, save the subjective symptoms. He complained of numbness and a “funny feeling” over the lumbar region.

He was removed to the Infirmary, where his arm was dressed, and he was sent home.

November 15th, 7.30 P.M.—He was highly feverish. Complained of great pain in his back, and also a pain in the abdomen, which was described as a “something pulling” at the umbilicus. The loins were ecchymosed over a space of two square inches, and there was tenderness on pressure, over abdomen and lumbar region. He had slept none since the accident, and had vomited during the most of the night. The vomited matter, according to the attendant, was very dark coloured, and the smell offensive. He had had no motion from his bowels.

It was advised that he should be kept absolutely at rest in bed. Fomentations were to be applied over loins and abdomen. Milk diet and sedatives were given.

The wounded arm was dressed antiseptically, and it healed in a day or two.

On November 16th, he was highly feverish. Pulse 120,

irritable. Respiration hurried. Had slept little during the night. Passed urine several times involuntarily, and complained of difficulty in moving his lower extremities, though sensation did not seem to be impaired. Vomiting ceased. Bowels slightly moved. Motion normal. Same treatment continued.

17th.—Had slept well during previous night. Feverishness lessened, and general condition improved; but bladder seemed further paralyzed, as urine came away in drops, though the bladder was in no way distended. Still complained of an inability to move lower extremities as freely as he used to do. Sensation unimpaired.

18th.—Had slept well all night. Feverishness much lessened. Had one natural motion during the night. He was able to move the lower limbs more freely, and the paralysis of bladder was less pronounced, as he had retained his urine for an hour several times during the day.

From this time forward, he gradually improved. The paralysis slowly passed off. His bowels moved freely, and the motions were natural. The pain was the last symptom to disappear. On the 25th, it was entirely gone; he was pronounced convalescent. At the same time, it was advised that great attention should be paid to his diet and exercise.

On January 1st, 1872, I was hurriedly asked to see him, about 7 A.M.; but on arrival, I found that he was dead.

The mother stated that he had been quite well from the time I last saw him (36 days previously). At first they had been careful with him; but afterwards, thinking that all danger was over, they gave him no particular attention.

On New-Year's-eve he had partaken of a hearty supper, and had gone to bed late. At 2 A.M. he complained of a pain in his abdomen, and commenced to vomit. His mother, thinking that he had indulged too freely in the pleasures of the table, paid no attention at first. The pain, however, became greater, and fomentations were applied, which seemed to give him relief. As he fell asleep about 4 A.M., he was left alone. At 6.30 she visited him, when he was found to be insensible, and shortly afterwards died.

Autopsy.—On January 3, 1872, a *post-mortem* examination was made by Dr Allan and myself.

The body was that of a well-developed male, apparently about 14 years of age, presenting the cicatrix of a wound on the right arm.

Thorax.—Lungs and heart were normal.

Abdomen.—On opening the abdomen about a pint of serous fluid of a dark colour escaped. Considerable adhesions were found between the peritoneum, the omentum, and the small intestines. A large extent of the small intestines was of a chocolate colour, with here and there a patch of ash grey hue. The position of these adhesions, which formed an agglutinated mass, was, for the most part, directly underlying the spot over which the wheel had passed on the 14th Nov. Other abdominal viscera healthy.

CASE II.* Joseph L., Police Constable, aged about 30 years, was kicked on the abdomen on the 12th February, 1871, and was off duty for ten days in consequence.

He returned to duty on the 22nd February, and continued till 5th April, when he was off for two days, and on the 25th April for one day. On the 1st May he again went on the sick list, and continued on it till the 7th May, when he died—twelve weeks from the date of injury.

He continued to complain of pain in the “belly” from the date of injury up till death. During his last illness he suffered apparently from peritonitis.

Autopsy.—On a *post-mortem* inspection, the bowels and omentum were glued together, and a portion of the smaller bowel, about a foot in length, was of a dark chocolate colour, and for some inches about the middle of the dark portion, there were several gangrenous spots on the mucous surface, one of which had perforated the bowel, and caused death.

There was no doubt in my mind, from the inspection, that death had followed from the injury sustained twelve weeks before.

Here, then, are two cases of injury to the abdomen; the

* This case happened in the practice of a medical friend, by whom it is communicated.

one caused by a violent kick; the other, by the passing of the wheel of a vehicle; in both, a somewhat similar lesion was produced, having a period of complete immunity from symptoms in the one case, and nearly so in the other; each being then followed by a sudden and unexpected awakening of the disease, and terminating fatally soon after.

Case No. I. showed symptoms of a grave character, which passed off in eleven days from the date of injury; for thirty-six days afterwards he enjoyed complete exemption from pain, or other symptom, which could in any way arouse a suspicion of the state of matters which existed internally. At the end of this time, an error in diet seems to have awakened the pre-existing disease, which had, till then, remained in a state of quiescence; peritonitis set in, and death ensued in four-and-a-half hours from the first exhibition of the symptoms.

In Case No II., although the patient complained of pain during the whole time, yet it was not such as to prevent him from attending to his usual avocation, which he continued to do for a period of sixty-seven days (with the exception of three days off duty), at the end of which he took to bed, and died on the seventh day after from peritonitis.

These instances illustrate the very great care which is necessary in dealing with such cases, and the constant supervision required for a considerable time after the last symptom has disappeared.

As the pain was the last symptom in Case No. I., and as it lingered all through Case No. II., it should be regarded, even though slight, as an evidence that the affected part has not quite recovered itself; and, until it has entirely subsided, the patient should be considered in danger. After all symptoms have disappeared, exercise and dietary should have unremitting attention, as the slightest excess in either way may be the exciting cause to the development of the latent disease.

In a medico-legal aspect these cases are of importance, demonstrating the *guarded prognosis* required from a medical witness; as in the period during which there was immunity

from symptoms in the first case, the defender (a cabdriver) was tried and found guilty, but as the injuries were neither considered to *involve danger to life, nor ultimate impairment of health*, he was fined in a small sum and set at liberty.

V.—CASE OF EMPYEMA TREATED SUCCESSFULLY BY PNEUMATIC ASPIRATION.

By J. H. LILLY, L.R.C.P.E., *Resident Medical Officer, City of Glasgow Fever Hospital, Belvidere, Glasgow.*

THE record of a case of empyema successfully treated by thoracentesis is not now an uncommon occurrence, but the record of a case, where in all somewhat above eight gallons of fluid was removed, with a most admirable result, seems especially appropriate to the time when, at the Academy of Medicine in Paris, and in the medical journals of this country, the proper procedure to be adopted for the removal of empyema has been so much discussed.

Thomas M.F., a stout, active, muscular youth, eighteen years of age, by trade a blacksmith, admitted into the City of Glasgow Fever Hospital, Belvidere, 10th December, 1871, stated that two days previous to admission he had a shivering, followed by a lancinating pain in the left side, which was greatly increased on taking a deep breath. He had always enjoyed good health previously. There was no association with fever.

On physical examination the whole of the left side of the chest was dull on percussion, crepitation was heard over the same area, there were rusty sputa, and the diagnosis was plainly pneumonia of the left side.

The case was treated in the ordinary way, chiefly by poulticing. Nothing of sufficient moment to note here presented itself, until 10th January, 1872, when the increasing dyspnoea and inability to sleep on the right side caused me to repeat a close physical examination of the chest, with the following result. On superficial examination the two sides of the chest were markedly unequal.

The following measurements, taken whilst the patient was sitting up in bed, with arms elevated, show that the left was much the larger:—

(a) From the median line opposite the second intercostal space to the spinous process of the seventh cervical vertebra, on the right side, 16 inches; on the left $18\frac{1}{2}$.

(b) On a line with the nipple to the third dorsal vertebra, right side 17, left 19 inches.

(c) From top of ensiform cartilage to tenth dorsal vertebra, right side 17, left 18 inches.

The heart was greatly displaced. The apex beat was felt at a point in the *right* nipple line (perpendicular) between the 5th and 6th ribs. There was no R. M. on the left side anteriorly, and percussion was quite dull. Posteriorly in the upper third there were some coarse crepitant râles, and the respiratory sounds were very rough. The lower two thirds were absolutely dull on percussion; there was no vocal fremitus, or R. M., and vocal resonance was diminished. The right side anteriorly was normal on percussion, except the region occupied by the heart. A few coarse râles were heard throughout the lung; and posteriorly the dulness was continuous from the left side, to about two inches beyond the spinous processes of the vertebræ on the right. Dr Russell, who had seen the case several times previously, also examined the patient, and verified these facts. We found no difficulty in coming to the conclusion that we had a case of hydrothorax, or, as it turned out, a case of empyema to deal with.

January 15th.—The dyspnoea, and other symptoms of oppression, becoming worse, Dr Russell decided to perform thoracentesis, using Dr G. Dieulafoy's Pneumatic Aspirator, as modified by Messrs Weiss. A description of the instrument will be found in the Liverpool Medical and Surgical Reports, Vol. V., in a Paper by Dr Lyster, who gives the history of six cases, in which he successfully removed, in this way, collections of pus from the pleural cavity. It consists essentially of a chamber exhausted of air, so far as can be, and put in communication with the cavity containing the pus by a capillary needle, through which the purulent fluid rushes rapidly to fill up the vacuum. The expulsion of the fluid into a receptacle, the re-

exhaustion of the chamber, and its re-filling with the fluid, are continued until the operation is finished. The needle was introduced between the 7th and 8th ribs, in the line of the axilla. At the beginning of the operation the patient suffered greatly from dyspnoea, in consequence of his being placed on his back, but this wore off as the operation proceeded, and the thoracic viscera were relieved from pressure. The large quantity of 6 pts. 10 oz. of pus was removed. The operation occupied nearly two hours; but, notwithstanding the quantity of fluid removed, no tendency to collapse was ever manifested. Indeed, the patient suffered so little inconvenience at the time, and experienced so much immediate relief, that he took his supper with evident relish, and slept all night on his right side. This was the first time he had done so for a considerable period.

The dimensions of the chest were taken again at the same places as previously noted. The figures within brackets are the former measurements.

| | | | | | |
|-------------------|---------------------|------|--------------|-------------------|---------------------|
| (a) Right side, - | $15\frac{3}{4}$ in. | (16) | Left side, - | 16 in. | ($18\frac{1}{2}$) |
| (b) " - | 17 " | (17) | " - | 17 " | (19) |
| (c) " - | $16\frac{1}{2}$ " | (17) | " - | $16\frac{1}{2}$ " | (18) |

The apex beat of the heart was found to be immediately behind the ensiform cartilage. The percussion sound in left axilla, and front of chest, above the level of the nipple, was normally clear. Below the clavicle and in axilla, R.M. was audible, but faint; a few crepitant râles were also heard. Below the level of nipple R.M. could not be detected, and the dulness extended downwards to a line on a level with the ensiform cartilage. Below this line the percussion sound was tympanitic; at the seat of puncture and posteriorly there was still absolute dulness. Patient expressed himself as "being very much better, able to sleep on either side, and not now troubled with shortness of breath."

A fortnight after the operation (January 29), it was quite evident that the fluid was reaccumulating, but not to any extent. At this period patient had some rheumatic pains, with swelling of hands and wrists, which soon passed away.

On the 31st, Dr Russell introduced a needle in the same region as before, but no fluid appeared in the instrument. On the withdrawal of the needle it was found to contain a drop of pus. Dr R. stated that the needle seemed to enter some dense substance, and that, whilst inserted to its greatest depth, it was manifest that the point was not free in a cavity.

On February 24th, the chest was again measured, showing, as was manifest, indeed, from the general symptoms, a large reaccumulation. The figures in brackets represent the state of things immediately after the operation:—

| | | | | |
|-----|---------------|---------------|--------------|---------------|
| (a) | Right side, - | 16½ in. (15¾) | Left side, - | 17½ in. (16) |
| (b) | “ | - 18 “ (17) | “ | - 18 “ (17) |
| (c) | “ | - 17 “ (16½) | “ | - 17½ “ (16½) |

The apex beat of heart was between the 5th and 6th ribs, about an inch to left of right nipple line.

On March 1st, the operation was repeated. This was done in the same situation as before, and 5 pts. 5 oz. of fluid were withdrawn, the pus being rather thicker than at last operation, and perfectly sweet.

A week later (March 8th) the operation was repeated, and the result was 1 pt. 3 oz. of fluid, but the character of the fluid was changed. It was now of a dirty brick red colour, and was found to consist of a mixture of pus, and a small quantity of blood.

After another interval of a week (March 16th) the chest was again punctured, and the enormous quantity of 7 pts. 15 oz. was obtained. The fluid had the same characters as that obtained at the previous operation.

It was quite evident that if we allowed the pus producing cavity to fill again and again in this way, its evacuation could have no ultimately useful effect. To allow the walls of the abscess to contract, it must not only be emptied but kept empty. As the operation was not more formidable than pricking the skin with a pin either as to pain or possible risk, it was decided to use the aspirator steadily every day. It would be tedious to describe those successive operations, but I have arranged the date of each, the amount of fluid

withdrawn, with some remarks on its character, &c., in the following table, which will give a good idea of the progress of the case towards a cure :—

| Date of Operation. | Quantity of Fluid Withdrawn. | | Description of Fluid. | | Remarks. |
|--------------------|------------------------------|---------------|-----------------------|-----|--|
| | Pts. | Oz. | | | |
| Jan'y. 15 | 6 | 10 | Pus | ... | Laudable Pus. |
| " 31 | ... | ... | ... | ... | |
| March 1 | 5 | 5 | ... | ... | |
| " 8 | 1 | 3 | Pus and Blood | | {Brick red in colour, caused by presence of blood. |
| " 16 | 7 | 15 | " | " | |
| " 21 | 2 | ... | " | " | |
| " 22 | 2 | 5 | " | " | |
| " 23 | ... | 8 | " | " | |
| " 25 | 3 | ... | " | " | |
| " 26 | 1 | 5 | " | " | |
| " 27 | ... | 7 | " | " | |
| " 28 | 2 | 10 | " | " | |
| " 29 | ... | ... | ... | ... | |
| " 30 | ... | ... | ... | ... | |
| " 31 | ... | $\frac{1}{2}$ | " | " | Needle introduced twice. |
| April 1 | ... | 2 | " | " | |
| " 3 | 3 | 8 | " | " | |
| " 6 | ... | 11 | " | " | |
| " 8 | ... | 12 | " | " | |
| " 9 | ... | 7 | " | " | |
| " 10 | ... | 6 | " | " | |
| " 11 | ... | $\frac{1}{2}$ | Blood | ... | Needle evidently entered lung. |
| " 12 | ... | 13 | Pus and Serum | | |
| " 13 | ... | 6 | " | " | |
| " 14 | ... | 2 | " | " | Blistered. |
| " 15 | ... | $\frac{1}{2}$ | " | " | Weight—9 st. |
| " 16 | ... | ... | ... | ... | |
| " 17 | ... | 10 | " | " | |
| " 18 | ... | 4 | " | " | |
| " 19 | ... | 2 | " | " | |
| " 20 | ... | 1 | " | " | |
| " 21 | ... | $\frac{1}{4}$ | " | " | |
| " 22 | ... | $\frac{1}{2}$ | " | " | Weight—9 st. 10 lbs. |
| " 23 | ... | ... | ... | ... | |
| " 24 | ... | $\frac{3}{4}$ | " | " | |
| " 25 | ... | ... | ... | ... | |
| " 26 | ... | ... | ... | ... | |
| " 27 | ... | 7 | " | " | Pale red sediment, $\frac{1}{8}$ per cent. |
| " 28 | ... | 2 | " | " | |
| " 29 | ... | ... | ... | ... | Weight—10 st. 2 $\frac{1}{2}$ lbs. |
| May 1 | ... | ... | ... | ... | |
| " 2 | ... | ... | ... | ... | |
| " 4 | ... | ... | ... | ... | Blistered. |
| " 9 | ... | ... | ... | ... | |

It will be observed that the first of the daily operations was on the 21st March, when two pints of fluid were obtained. It is right to explain, however, that the effectual unbroken execution of our plan cannot be said to have begun till the 8th of April. Previous to that there were tappings without result, of a capricious sort, which were afterwards found to arise from derangement of the instrument, the vacuum not being maintained. There is no doubt that the large quantities obtained on the 25th and 28th March and 3rd April, particularly at the latter date, arose from previous fruitless punctures as well as from accumulation taking place while the instrument was being repaired. On 3rd April 3 pints 8 oz. were drawn off; on the 6th, 11 oz.; on the 8th, 12 oz.; and from that date to the end of April, without the omission of a day, the capillary needle was introduced. No fluid was formed after the 28th April, so that the systematic treatment of the case with the aspirator, as it ought to have been treated from the first, may be said to have lasted only during the month of April.

During the whole course of this treatment the patient went about freely, enjoying a most vigorous appetite, and living almost constantly in the open air of the grounds of Belvedere. When the operation was about to be done he went to bed, and the needle was introduced while he sat up, sometimes between the 6th and 7th, sometimes between the 7th and 8th ribs, and either forward or backward in those spaces as auscultation and percussion seemed to direct. So soon as the chest wall began to collapse, a difficulty was experienced in guiding the needle between the edges of the ribs which overlapped. When the fluid was exhausted and the needle withdrawn, no trace of the operation was visible but a puncture, which literally was a mere flea-bite to look at, and the patient then dressed and walked off.

An interesting change in the character of the fluid was soon observed. It became coloured with blood in the beginning of March; but on 12th April the fluid was evidently largely composed of pure serum, with an admixture of pus. This formed a yellow layer when allowed to

settle, and when a succession of specimens in urine-glasses, all holding the same amount of fluid, were obtained from day to day, and placed side by side, a rough comparison of the proportion of pus could be made, and it was interesting to note how the yellow layer diminished in thickness, until it all but disappeared.

Observing this change in the character of the fluid, Dr Russell thought that a blister might aid in preventing its further effusion. On 14th April the left side was almost covered with a large fly-blister, which rose well. After this the amount of fluid obtained was often *nil*, and always trifling. Another blister was ordered, 4th May, to make assurance doubly sure.

Before the patient was dismissed, his chest was carefully examined and measured. The first thing which drew attention was a very obvious depression of the left shoulder, and arching of the spine and trunk towards that side; this was due to the mechanical compression of the parietes of the chest, necessary to fill up the space left vacant by the compressed lung. The measurements at the nipple line were—Right side, $17\frac{5}{8}$ inches, left side, $16\frac{3}{8}$ inches; but the following will more plainly show the collapsed state of the left side of the chest. By means of two rods of lead tubing, we got an outline of the chest, at two levels, the nipple line, and two inches below it—which we will designate A and B respectively. Anterio-posterior in the median line, A 9 inches. B $9\frac{6}{8}$ inches. From median line to furthest point of right circumference, A $6\frac{3}{8}$ in., B $6\frac{3}{8}$ in.; to furthest point of left, A $5\frac{5}{8}$ in., B $5\frac{1}{8}$ in.; total width, A 12 in., B $11\frac{7}{8}$ in. Thus it will be seen that the area of a section of the right half of the chest would be much greater than the left. The cardiac dulness extended $1\frac{1}{2}$ inches beyond the median line on the right side, at the level of the nipple. The lung sounds on the left side were pure, but very feeble, throughout the whole chest. Right side normal.

The general health of the patient was extremely good. There was no dyspnœa, not even on taking a sharp walk. The gain in weight of the patient was very remarkable.

Unfortunately, he was not weighed in the early part of the treatment. In one week he gained 10 lbs., and the week following $6\frac{1}{2}$ lbs. When first weighed, his weight was 9 stones, and a day or two before his dismissal, he had reached 10 stone $7\frac{3}{4}$ lbs.

In conclusion, I would wish to direct attention to some lessons which were strongly suggested to my mind during the treatment of the above case. The result, as a whole, was certainly satisfactory, but the progress of the case, after the adoption of daily withdrawal, as recorded above, very conclusively proves the necessity of frequent and repeated evacuation. Even the partial evacuation of an abscess, as is well known, powerfully diminishes the tendency to the formation of pus, by removing the irritation which arises from pressure. As already remarked, had the operation been repeated daily from the first, this case would have been brought much sooner to a successful termination, and the lung would, in all probability, have been saved.

The complete harmlessness with which Dieulafoy's instrument may be used, renders it a most valuable exploratory agent where the diagnosis is doubtful. The result produced on the chest wall, by the introduction of a needle twenty or thirty times, within the area of a circle, an inch in diameter, was merely slight oedema and hardening of the tissues, and even this very soon disappeared.

VI.—ON PUTREFIERS AND ANTISEPTICS.

By JOHN DOUGALL, M.D., Medical Officer of Health for the Burgh of Kinning Park, Glasgow.

THE following experiments were made to ascertain—I. Whether putrefaction can be accelerated by adding certain chemicals to fresh organic fluids. II. The relative antiseptic powers of different bodies, as evinced by their preventing the appearance of fungi and animalcules in organic fluids with which they are mixed. III. The relative aerial antiseptic powers of different volatile bodies, as evinced by

their preventing the appearance of fungi and animalcules in organic fluids exposed to their vapours, and by their action on vaccine lymph.

I.—WHETHER PUTREFACTION CAN BE ACCELERATED BY ADDING CERTAIN CHEMICALS TO FRESH ORGANIC FLUIDS.

During fully two years' assiduous experimentation to determine the antiseptic powers of different bodies, various phenomena of putrefaction—as the differentiation, number, form, habits, &c., of the organisms in putrefying fluids, with several other occult metamorphoses—were of necessity frequently observed. These, however, though of absorbing interest, were not specially noted, because not directly contributing to the object of research. Furthermore, it frequently appeared that several of the chemical bodies tested seemed rather to favour than retard putrefaction, these having either a neutral or alkaline reaction, except spirits of nitric ether and magnesian sulphate. Subsequently, it was resolved to ascertain, by experiment, whether the substances alluded to, including a few others having the same reactions, were in reality promoters of putrefaction.

I.

Three and a-half drams distilled water, containing one in 500 of one of the following substances, also half a dram of a filtered solution of beef juice, sp. gr. 1·4, were put in glass tubes which had been previously rinsed with fuming nitric acid, and afterwards with distilled water. Four drams of beef juice and water, without any chemical added (simple solution), were also set aside for comparison. Temperature ranging from 58° to 63° Fah.

Soda and Salts.

| | | | | | |
|------------------------------|-----|-----|-----|-----------|-----------|
| °Soda, | ... | ... | ... | Solution. | Alkaline. |
| Bi-borate of Sodium, | ... | ... | ... | Do. | Neutral. |
| Sulphate of do., | ... | ... | ... | Do. | Do. |
| Hyposulphite of do., | ... | ... | ... | Do. | Do. |
| Chloride of do., | ... | ... | ... | Do. | Do. |
| Stearate of do. (Hard Soap), | ... | ... | ... | Do. | Do. |

Potash and Salts.

| | | |
|---|-----------|-----------|
| *Potash, | Solution. | Alkaline. |
| *Nitrate of Potassium, | Do. | Neutral. |
| *Chlorate of Potassium, | Do. | Do. |
| Permanganate of do., | Do. | Do. |
| Condy's Fluid (Permanganate of Potassium), | Do. | Do. |

Ammonia and Salts.

| | | |
|-----------------------------|-----------|-----------|
| Ammonia, | Solution. | Alkaline. |
| Bromide of Ammonium, | Do. | Neutral. |
| Chloride of do., | Do. | Do. |

Various.

| | | |
|---------------------------------|-----------|---------------|
| Pepsine, | Solution. | Neutral. |
| *Lime, | Do. | Alkaline. |
| Spirits of Nitric Ether, | Do. | Faintly acid. |
| Acetone, | Do. | Neutral. |
| Acetate of Morphia, | Do. | Do. |
| Sugar, | Do. | Do. |
| Sulphate of Magnesium, | Do. | Faintly acid. |
| Charcoal, | Do. | Neutral. |

In all these mixtures, excepting that with ammonia, permanganate of potassium, and the simple solution, life was observed on the second day. On the third day life was present in the permanganate and in the simple solution, and on the fourth day in the ammonia solution.

II.

Filled same tubes with equal parts of a solution consisting of one part of the fore-mentioned bodies in 500 parts of water and solution of beef juice, sp. gr. 1.4. Filled also one tube with equal parts of beef juice and water (simple solution); temperature, 58° to 64° Fah. Life appeared in all the mixtures in twenty-four hours, except in the permanganate and simple solutions. In the latter it was very sparse in thirty-six hours, but without bad odour, while it did not appear in the former till the lapse of sixty hours. The solutions of the bodies marked with a star were very putrid in thirty-six hours.

III.

Filled same tubes with equal parts of a solution consisting of one part of the fore-mentioned bodies in 500 parts of water, and infusion of hay. Filled also one tube with equal parts of water and hay infusion (simple solution). In twenty hours life was present in the soap solution, and in all the others in thirty hours, except the permanganate, ammonia, simple, and bi-borate of sodium solutions, in which it appeared in forty hours.

IV.

To seven parts of a saturated aqueous solution of sulphuretted hydrogen was added one part of a solution of beef juice; mixture strongly acid. No life till fourth day; mixture neutral on fifth day, and odour extremely putrid. Equal parts of a saturated aqueous solution of sulphuretted hydrogen and solution of beef juice were mixed. Life was present in ten hours, but putrefaction progressed very languidly, judging from the continued faintness of odour.

Hence it appears that an excess of sulphuretted hydrogen producing acidity first antisepts, but, when the reaction becomes neutral, intensifies putrefaction; while conversely a weak solution of the gas hastens the commencement of putrefaction, but subsequently renders that process more protracted.

The results of these experiments show that the substances enumerated above, with the narrow exception of permanganate of potassium, ammonia, and bi-borate of sodium, hasten decomposition when mixed in small portions with fresh putrescent or fermentable fluids. Moreover, it is seen that ammonia is a putrescent in Experiment II., and bi-borate of sodium in Experiments I. and III., the only permanent exception being permanganate of potassium, which, in the circumstances, is slightly antiseptic.

It is obviously probable that all these bodies have not equal putrefying energy; yet putrefaction ensues so rapidly after they are mixed with the organic fluids that it would be manifestly difficult to determine their relative putrefying

powers, assuming the time when microzymes appear in the individual mixtures as a measure of such powers. Though this, however, were correctly ascertained, it would only exhibit the different tendencies of the various bodies in making a fresh substance putrid, without showing how much or how little each had intensified the subsequent phenomena of putrefaction. This could only be accurately known—1st, by noting the time of the disappearance of organisms from the separate mixtures; 2nd, by the cessation of the bad odour; 3rd, by the fluid becoming comparatively clear. It has also been stated that when an albuminous solution has ceased to putrefy, it gives no precipitate with nitric acid and heat. I have found, however, a precipitate still obtainable from such a fluid, after organisms, putrid odour, and cloudiness had apparently disappeared. It must be remembered, nevertheless, that I refer only to fluids whose decomposition has been characterized by the presence of vibrios, bacteria, putrid odour, and cloudiness—true putrefaction. On the other hand, where the fluid has fermented, known by the presence of torulæ, penicillia, faint mouldy aroma, and transparency, no precipitate whatever can be obtained, and that even when the products of fermentation are abundantly present. Indeed, I have found, by comparison, that fermentation is a much more active and effective process than putrefaction, and that the former process frequently changes into the latter, while the converse seldom takes place, and only partially. In the foregoing experiments these data could not be used on which to base the results, as my object was not to determine relative but actual putrefying power—the analyses were *qualitative* not *quantitative*, and this having been ascertained in the affirmative, clears the way for future investigations into relative putrefying powers. Of course I do not aver, as hitherto unknown, that certain bodies hastened decomposition of organic matter. All admit that oxidizers act thus, *qua* their oxygen, while Dr Gregory states* that Eremacausis (slow oxidation) is greatly assisted by the presence of alkalies, but it will be conceded that far less is known

* Organic Chemistry, page 30, ed. 1852.

of putrescents than of antiseptics, and that more detailed knowledge regarding this action of such bodies is not only highly desirable, but, in a sanitary point of view, quite indispensable. Although I have not yet experimented to determine the relative putrefying powers of the substances tabulated, still, as those marked * seemed specially vigorous at the outset, it may be reasonably inferred they will continue so throughout, and hence, in the meantime, should be considered as the most active in the group.

The results of the experiments further indicate that the alkalies and alkaline earths, and their alkaline and neutral salts, with a few exceptions, hasten decomposition when present in small proportion, in fluids containing organic matter. Indeed, from observing the reaction of the various substances in the fourth division, it may be safely predicated that the great majority of bodies soluble in, or miscible with, water, and having a neutral, alkaline, or faintly acid reaction, induce putrefaction, *not fermentation*, in favourable circumstances. This point merits the attention of sanitarians, and practically means that all domestic soap-suds, spent leys from soap works, bleach works, paper works, &c., liquors accumulated at the base of the waste heaps of chemical works where soda-ash is manufactured, being generally more or less alkaline, hasten putrefaction of organic matter in sewage, if allowed to mix with it. We may get a hint from nature here. Healthy human urine and fæcal matter are acid; but when they putrefy, either in or out of the body, are alkaline.

The *modus operandi* of these putrefiers I have been unable to solve satisfactorily, and an attempted explanation of which leads into the labyrinths of search after final causes, ending in the regions of hypothesis. Certainly they are not oxidizers, Condry's fluid, carbon, and probably chlorate of potassium, excepted, though they seem to favour oxidation, perhaps in the majority, by their softening and disintegrating influence, thus causing a greater surface to be presented to the atmosphere. By the same action they may weaken the cohesive power of the organic molecules, thus facilitat-

ing their chemical transformation into simpler compounds, which is held by many to take place without the intervention of oxygen.

It will be observed in the table that saltpetre, common salt, and sugar, substances which preserve meat when used in large quantities, act as putrefiers when used in small quantities. The results of the action of permanganate of potassium are similar; and I believe Dr B. W. Richardson has shown the same of ammonia.

II.—THE RELATIVE ANTISEPTIC POWERS OF DIFFERENT BODIES, AS EVINCED BY THEIR PREVENTING THE APPEARANCE OF FUNGI AND ANIMALCULES IN ORGANIC FLUIDS WITH WHICH THEY ARE MIXED.

At the meeting of the British Association, Edinburgh, 1871, I read a paper "On the Relative Powers of Various Substances in Preventing Animalcules in Solutions of Beef Juice, Infusion of Hay, and in Urine." The experiments there detailed were undertaken for the purpose of determining, as far as practicable, the relative preservative powers of a number of well-known and alleged antiseptics. The average amount of a substance necessary to prevent the appearance of animalcules in a given time, in the three fluids, being assumed as its antiseptic power. The appearance of animalcules as a proof of putrefaction is universally admitted; as revealed by the microscope, whether in great or small numbers, these organisms are not only indubitable evidence of that process, though the medium in which they are seen be apparently clear and untainted, as when putrefaction is incipient or expended, but also its first, last, surest, and most easily demonstrated manifestation. They are only present in fluids containing organic matter, and, moreover, only when that matter is in a state of putrefaction, hence their presence indicates the presence of putrefying matter, and their absence, either the absence of that matter, or that it is not putrefying. The faintest degree of decomposition seems sufficient, by some obscure correlation with their nature, to endow them with existence—generating or developing them—enduing dead matter with life, or

kindling the vital forces lying dormant in their germs. Hence, some consider them the cause of putrefaction, others the result; while some hold their function in nature to be malignant, and others to be benign. Without, however, entering into these questions, it was enough for my purpose that they afforded sure data for classifying antiseptic powers.

In the paper alluded to, no special notice was taken of fungi, which are frequently present in such fluids as those examined, and, as many biologists hold these to be as intimately associated with the decomposition of organic matter as mycrozymes are, I subsequently resolved to repeat the experiments with the more decided antiseptics, and ascertain their preventive power on fungi, as well as on animalcules, adding a few substances not previously included, besides varying the mode of procedure, so as to test the correctness of previous results. The experiments were carried on from the beginning of April till the end of October. Those who have an opportunity of comparing the results in the following tables with those in the paper referred to, will find them to coincide remarkably in the great majority of instances considering the dissimilarity of the data on which they are founded.

I.—*Beef Juice.*

Three and a half drams distilled water, containing 1 in 500 of one of the following substances, also, half a dram filtered solution of beef juice, sp. gr. 1.4, were put in glass tubes previously rinsed with fuming nitric acid, and afterwards with distilled water. These were kept at a temperature varying from 58° to 65° Fah. for 100 days, during which the mixtures were frequently examined with a magnifying power of 700 diameters. The tubes containing volatile substances were closed, the others were left open. The following table shows the results. The blank spaces indicate that no microzymes or fungi were present in 100 days. *Pen.* denotes *Penicillia*; *Tor.*, *Torulæ*; *B. P.*, British Pharmacopœia.

| NAME OF SUBSTANCE. | Reaction of fluid before Beef Juice was added. | Days when Animalcules were seen. | Reaction when Animalcules were seen. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---|--|----------------------------------|--------------------------------------|----------------------------|--------------------------------|-------------------------------|---|
| Liquor of the Perchloride of Iron (B. P.),..... | Acid. | 42 | Neutral. | 4 Pen. | Acid. | 10 | |
| Chromic Acid, | Do. | 78 | Do. | 38 Pen. | Do. | 74 | |
| Boracic Acid, | Neutral. | 2 | Do. | ... | ... | 3 | |
| Citric Acid,..... | Acid. | 13 | Do. | 3 Tor. | Acid. | 14 | { The mixture had a distinct perfume of orange on the eighth day. |
| Baric Chloride,..... | Neutral. | 1 | Do. | 85 Tor. | Neutral. | 2 | |
| Equal parts of Quinine and Sulphuric Acid, | Acid. | 23 | Do. | 3 Tor. | Acid. | 10 | |
| Cupric Sulphate,..... | Do. | 86 | Acid. | 20 Pen. | Do. | 80 | |
| Mercuric Chloride,..... | Do. | ... | ... | ... | ... | ... | No change in 176 days. |
| Ferrous Sulphate, | Do. | 14 | Neutral. | 5 Tor. | Acid. | 14 | |
| Arsenious Acid, with a trace of Hydrochloric, | Do. | 2 | Do. | ... | ... | 3 | |
| Potassio-ferric Sulphate (Iron Alum) | Do. | 24 | Do. | 4 Pen. | Acid. | 20 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Beef Juice was added. | Days when Animalcules were seen. | Reaction when Animalcules were seen. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---------------------------------|--|----------------------------------|--------------------------------------|----------------------------|--------------------------------|-------------------------------|------------------------|
| Plumbic Acetate, | Acid. | 28 | Neutral. | 5 Pen. | Acid. | 20 | |
| Tartarized Antimony, | Do. | 4 | Do. | 2 Pen. | Do. | 4 | |
| Zinc Sulphate, | Do. | 30 | Do. | 4 Pen. | Do. | 35 | |
| Argentie Nitrate, | Neutral. | ... | ... | ... | .. | ... | No change in 176 days. |
| Benzoic Acid, | Acid. | ... | ... | ... | ... | ... | No change in 176 days. |
| Hydrocyanic Acid (B. P.), | Neutral. | 22 | Neutral. | 21 Tor. | Neutral. | 24 | |
| Picric Acid, | Acid. | 44 | Do. | 11 Pen. | Acid. | 25 | |
| Oxalic Acid, | Do. | 28 | Do. | 4 Pen. | Do. | 12 | |
| Carbolic Acid, | Neutral. | 12 | Do. | 50 Tor. | Neutral. | 12 sourish | |
| Aluminic Chloride, | Acid. | 19 | Acid. | 4 Pen. | Acid. | 10 | |
| Alum, | Do. | 14 | Neutral. | 6 Pen. | Do. | 16 | |
| Chloride of Lime, | Alkaline. | 27 | Acid. | 27 Tor. | Do. | 29 | |
| Chloralum, | Acid. | 10 | Neutral. | 3 Tor. & Pen. | Do. | 10 | |
| Bisulphite of Calcium, | Do. | 4 | Do. | 92 Tor. | Neutral. | 3 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Beef Juice was added. | Days when Animalcules were seen. | Reaction when Animalcules were seen. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---|--|----------------------------------|--------------------------------------|----------------------------|--------------------------------|-------------------------------|----------|
| Nitric Acid, | Acid. | 18 | Neutral. | 4 Pen. | Acid. | 16 | |
| Sulphuric Acid, | Do. | ... | ... | 5 Pen. | Do. | 5 rusty | |
| Hydrochloric Acid, | Do. | 28 | Neutral. | 4 Pen. | Do. | 10 | |
| Nitro-Hydrochloric Acid, | Do. | 10 | Do. | 3 Pen. | Do. | 10 | |
| Sulphurous Acid, | Do. | 24 | Do. | 4 Pen. | Do. | 20 | |
| Alcohol, | Neutral. | 4 | Do. | 4 Tor. | Neutral. | 4 | |
| Tincture of Iodine B. P., | Do. | 1 | Do. | 80 Tor. | Do. | 2 | |
| Strychnia, with a trace of Hydrochloric Acid, | Acid. | 7 | Do. | 4 Pen. | Acid. | 9 | |
| Sulphate of Beberia, | Neutral. | 4 | Do. | 2 Tor. | Neutral. | 4 | |
| Potassic Dichromate, | Acid. | 90 | Do. | 40 Pen. | Acid. | 60 | |
| Quinine (pure), | Neutral. | 1 | Do. | ... | ... | 2 | |
| Zinc Chloride, | Acid. | 4 | Acid. | ... | ... | 4 | |
| Simple Solution, | Neutral. | 1 | Neutral. | 74 Tor. | Neutral. | 2 | |

II. *Egg-Albumen*.—Three and a half drams of distilled water, containing 1 in 500 of one of the following substances, were put in glass tubes previously rinsed with fuming nitric acid, and afterwards with distilled water. To each tube was then added half a dram of a solution consisting of one part of white of egg to four parts of water. They were kept at a temperature varying from 55° to 66° Fahrenheit for 100 days, during which their contents were frequently examined with a magnifying power of 700 diameters. The following are the results. The blank spaces indicate that no microzymes or fungi were observed in 100 days:—

| NAME OF SUBSTANCE. | Reaction of fluid before Albumen was added. | Effect on Albumen when mixed with fluid. | Days when Animo-molecules were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|--|---|--|--------------------------------------|---|----------------------------|--------------------------------|-------------------------------|------------------------|
| Liquor of the Per-chloride of Iron (B.P.), } | Acid. | Slight coagulation. | 7 | Neutral. | ... | ... | 7 | No change in 182 days. |
| Chromic Acid, | Do. | Dense coagulum. | ... | ... | ... | ... | ... | |
| Boracic Acid, | Neutral. | Hazy. | 10 | Neutral. | ... | ... | 10 | |
| Citric Acid, | Acid. | Nil. | 10 | Acid. | 4 Tor. | Acid. | 10 | |
| Picric Acid, | Do. | Dense coagulum. | ... | ... | 44 Pen. | Neutral. | 53 | |
| Carbolic Acid, | Neutral. | Hazy. | 38 | Neutral. | 36 Tor. | Do. | 38 Sour. | |
| Nitric Acid, | Acid. | Nil. | 15 | Do. | 5 Pen. | Acid. | 11 | |
| Hydrochloric Acid, | Do. | Faint haze. | 9 | Do. | ... | ... | 9 | |
| Nitro-Hydrochloric Acid, | Do. | Nil | 41 | Do. | 14 Tor. & Pen. | Do. | 14 | |
| Baric Chloride, | Neutral. | Do. | 30 | Do. | 15 Tor. | Neutral. | 10 | |
| Equal parts of Quinine and Sulphuric Acid, | Acid. | Faint haze. | 8 | Do. | ... | ... | 10 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Albumen was added. | Effect on Albumen when mixed with fluid. | Days when Anima-les were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---|---|--|--------------------------------|---|----------------------------|--------------------------------|-------------------------------|--|
| Cupric Sulphate,..... | Acid. | Dense coagula. | ... | ... | ... | ... | ... | No change in 182 days. |
| Mereuric Chloride, | Do. | Do. | ... | ... | ... | ... | ... | No change in 182 days. |
| Ferrous Sulphate,..... | Do. | Red haze. | 35 | Neutral. | 40 Tor. | Neutral. | 35 | Red haze caused by the peroxidation of the Iron. |
| Arsenious Acid, with a trace of Hydrochloric, } | Acid. | Nil. | 33 | Do. | 5 Pen. | Acid. | 13 | |
| Potassio-Ferric Sulphate (Iron Alum),..... } | Do. | Dense red coagulum. | 46 | Do. | ... | ... | 50 | |
| Plumbic Acetate,..... | Do. | Considerable coagula. | 90 | Do. | 75 Pen. | Neutral. | 78 | |
| Tartarized Antimony,..... | Do. | Hazy. | 43 | Do. | 9 Tor. | Acid. | 13 | |
| Zinc Chloride, | Do. | Dense coagulum. | 18 | Acid. | ... | ... | 16 | |
| Zinc Sulphate,..... | Do. | Do. | 90 | Do. | 70 Pen. | Do. | 90 | No change in 182 days. |
| Argentio Nitrate,..... | Do. | Do. | ... | ... | ... | ... | ... | No change in 182 days. |
| Benzoic Acid,..... | Do. | Nil. | ... | ... | ... | ... | ... | |
| Hydrocyanic Acid, (B. P.) | Neutral. | Do. | 15 | Neutral. | ... | ... | 15 | |
| Oxalic Acid,..... | Acid. | Do. | 40 | Do. | 5 Pen. | Acid. | 12 | |
| Aluminic Chloride, | Do. | Do. | ... | ... | 8 Pen. | Do. | 13 | Very exuberant development of fungi. |
| Alum,..... | Do. | Slight coagula. | 38 | Neutral. | 15 Tor. | Do. | 36 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Albumen was added. | Effect on Albumen when mixed with fluid. | Days when Animales were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction. when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---|---|--|-------------------------------|---|----------------------------|---------------------------------|-------------------------------|--|
| Chloride of Lime,..... | Alkaline. | { Transparent elastic coagulum. | 40 | Neutral. | ... | ... | 40 | |
| Chloralum, | Acid. | Dense coagulum. | 9 | Do. | ... | ... | 9 | Very foetid. |
| Bisulphite of Calcium, | Do. | Nil. | 9 | Do. | ... | ... | 10 | |
| Sulphuric Acid,..... | Do. | Do. | 30 | Do. | 10 Tor. | Acid. | 10 | |
| Sulphurous Acid,..... | Do. | Slight haze | 8 | Do. | ... | ... | 10 | |
| Alcohol, * | Neutral. | Nil. | 10 | Do. | ... | ... | 12 | |
| Tincture of Iodine, | Do. | Do. | 15 | Do. | ... | ... | 17 | |
| Strychnia, with a trace of Hydrochloric Acid, } | Acid | Hazy. | 15 | Do. | ... | ... | 30 | |
| Sulphate of Beberia, | Neutral. | Dense coagula. | 8 | Do. | ... | ... | 10 | |
| Potassic dichromate,..... | Acid. | Slight coagula. | ... | ... | ... | ... | ... | No change in 182 days. |
| Quinine (pure),..... | Neutral. | Nil. | 4 | Do. | ... | ... | 16 | In 60 days mixture clear, life gone, taste bitter, gives precipitate with HNO ₃ . |
| Simple Solution, | Do. | Do. | 3 | Do. | .. | ... | 6 | Still very putrid in 100 days. |

* The protoplasmic membrane at top, and a deposit collected at the bottom of the tubes with alcohol and iodine were of a rich aniline hue. This has probably some connection with the spirit in these mixtures. Erdman (Jour. für Prakt. Chem., XCIX., p. 385), quoted by Mosler, has discovered that vibrios have the power of producing aniline colouring matter from protein substances. Parke's Prac. Hygiene, p. 239. Third Edition.

III. *Egg Albumen, Urine, and Beef Juice*.—Three and a half drams of distilled water, containing 1 in 500 of one of the following substances, were put in glass tubes, previously rinsed with fuming nitric acid, and afterwards with distilled water. To each tube was then added half a dram of a solution, consisting of equal portions of white of egg, fresh human urine, and solution of beef juice. They were kept at a temperature varying from 57° to 68° Fah. for 100 days, during which their contents were frequently examined with a magnifying power of 700 diameters. The following are the results. The blank spaces indicate that no microzymes or fungi were observed in 100 days:—

| NAME OF SUBSTANCE. | Reaction of fluid before Solution was added. | Effect on Solution when mixed with fluid. | Days when Am- males were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|--|--|---|--|---|----------------------------|--------------------------------|-------------------------------|---|
| Liquor of the Perchlo- ride of Iron (B. P.),... | Acid. | Nil. | 10 | Neutral. | 2 Pen. | Acid. | 10 | Exuberant develop- ment of fungus tufts on 2nd day. On 30th day fluid smells strongly of carbolic acid. On 50th day minute life very sparse. Several large animalcules in active motion. Odour of the acid distinct. 70th day those con- ditions still exist. 100th day no change. |
| Chromic Acid, | Do. | Dense coagulum. | ... | ... | ... | ... | ... | |
| Boracic Acid, | Neutral. | Nil. | 6 | Neutral. | 2 Pen. | Neutral. | 6 | |
| Citric Acid, | Acid. | Do. | 11 | Acid. | 2 Pen. | Acid. | 17 | |
| Picric Acid, | Do. | Dense coagulum. | 53 | Neutral. | 4 Pen. | Acid. | 53 | |
| Carbolic Acid, | Neutral. | Slight haze. | 30 myriads of or- ganisms, motions languid. | Do | ... | ... | ... | |

| NAME OF SUBSTANCE. | Reaction of fluid before Solution was added. | Effect on Solution when mixed with fluid. | Days when Anima-les were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|--|--|---|--------------------------------|---|----------------------------|--------------------------------|-------------------------------|---|
| Nitric Acid,..... | Acid. | Nil. | 11 | Neutral. | 2 Pen. | Acid. | 8 | |
| Hydrochloric Acid,..... | Do. | Do. | 4 | Do. | 2 Pen. | Do. | 4 | Very foetid. |
| Nitro-Hydrochloric Acid, | Do. | Do. | 43 | Do. | 2 Pen. | Do. | 6 | |
| Baric Chloride, | Neutral. | Hazy. | 2 | Do. | ... | ... | ... | |
| Equal parts of Quinine } and Sulphuric Acid, .. } | Acid. | Nil. | 50 | Do. | 2 Pen. | Do. | 50 | |
| Cupric Sulphate,..... | Do. | Dense coagula. | ... | ... | ... | ... | ... | |
| Mercuric Chloride,..... | Do. | Do. | ... | ... | ... | ... | ... | |
| Ferrous Sulphate, | Do. | Small dense coagula. | 4 | Acid. | ... | ... | 4 | |
| Arsenious Acid, with a } trace of Hydrochloric, } | Do. | Nil. | ... | ... | 3 Pen. | Acid. | 6 | |
| Potassio-Ferric Sulphate } (Iron Alum), | Do. | Hazy. | 31 | Alkaline | 3 Pen. | Do. | 16 | About 20 isolated fungus tufts on 3rd day clinging to sides of tubes. |
| Plumbic Acetate, | Do. | Dense coagula. | 60 | Neutral. | 11 Pen. | Do. | 60 | |
| Tartarized Antimony, | Do. | Hazy. | 5 | Faintly acid. | 82 Tor. sparse | Neutral | 5 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Solution was added. | Effect on Solution when mixed with fluid. | Days when Anima- malcules were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when odour was felt. | REMARKS. |
|------------------------------|--|---|--|---|----------------------------|--------------------------------|---------------------------|---|
| Zinc Chloride, | Acid. | Small dense coagula. | 10 sparse | Acid. | 5 Pen. | Acid. | 12 | At some period subsequent to the 8th day, this tube went amissing, hence the remark in the fungus column. |
| Zinc Sulphate, | Do. | Do. | 5 | Faintly acid. | ... | ... | 5 | |
| Argentio Nitrate, | Neutral. | Dense opalescence. | 8 | Neutral. | Not determined. | Not determined. | 8 | |
| Benzoic Acid, | Acid. | Nil. | ... | ... | ... | ... | ... | |
| Hydrocyanic Acid, | Neutral. | Slight coagula. | 4 | Neutral. | ... | ... | 4 | |
| Oxalic Acid, | Acid. | Nil. | 40 | Alkaline | 2 Pen. | Acid. | 16 | |
| Aluminic Chloride, | Do. | Do. | 80 | Neutral. | 2 Pen. | Do. | 20 | |
| Alum, | Do. | Do. | 51 | Do. | 2 Pen. | Do. | 55 | |
| Chloride of Lime, | Alkaline. | Hazy. | 35 | Do. | 24 Pen. | Neutral. | 40 | |
| Chloralum, | Acid. | Nil. | 11 | Do. | 2 Pen. | Acid. | 14 | |
| Bisulphite of Calcium, | Do. | Hazy. | 4 | Do. | 80 Tor. sparse. | Neutral. | 4 | At some period subsequent to the 8th day, this tube went amissing, hence the remark in the fungus column. |
| Sulphuric Acid, | Do. | Nil. | 84 | Do. | 2 Pen. | Acid. | 6 | |

| NAME OF SUBSTANCE. | Reaction of fluid before Solution was added. | Effect on Solution when mixed with fluid. | Days when Animalcules were seen. | Reaction of mixture when life appeared. | Days when Fungi were seen. | Reaction when Fungi were seen. | Days when bad odour was felt. | REMARKS. |
|---|--|---|----------------------------------|---|----------------------------|--------------------------------|-------------------------------|--|
| Sulphurous Acid, | Acid. | Slight haze. | 4 | Neutral. | ... | ... | 4 | |
| Alcohol, | Neutral. | Nil. | 1 | Do. | 78 Pen. sparse. | Neutral. | 1 | |
| Tincture of Iodine, | Do. | Do. | 1 | Do. | ... | ... | 1 | |
| Strychnia, with a trace of Hydrochloric Acid, } | Acid. | Do. | 8 | Do. | 4 Pen. | Acid. | 6 | |
| Sulphate of Beberia, | Neutral. | Slight coagula. | 7 | Do. | 5 Tor. sparse. | Neutral. | 8 | |
| Potassic Dichromate, | Acid. | Hazy. | ... | ... | 63 Tor. sparse. | ... | ... | |
| Quinine (pure), | Neutral. | Nil. | 4 | Neutral. | 42 Tor. | Alkaline | 6 | Animalcules in considerable numbers still present on 42nd day. |
| Simple Solution, | Do. | Do. | 1 | Do. | ... | ... | 1 | |

(To be Continued.)

VII.—THE "OPEN AIR" TREATMENT OF HOOPING-COUGH.

By DANIEL MACLEAN, M.D., L.F.P.S.G.

IN all the treatises on hooping-cough which I have examined, the peculiarity is remarkable, how uniformly they agree in having no definite plan of treatment. The remedies are all of an alternative character; if one medicine does not suit, try another. They recognise the fact that it is a spasmodic disease, and they range from one anti-spasmodic to another, till they have gone through the whole pharmacopœia. Being unable to get at the cause of the disease, they attack a symptom. All the remedies yet tried have been powerless to subdue the spasm. The question arises, Are you able to do what is thus aimed at? So far as it has been tried hitherto, it has been a failure. Whatever the complications, or where the tendency is towards death, most of the patients die by debility. These two points are worthy of remembrance, that we cannot control the cough, and that patients die from inability to resist its power.

However this may be, the profession, having so many alternative remedies for the disease, indicates the fact, that no intelligent plan of treatment has yet been fallen upon. It seems as if the profession were still groping in the dark; and having the spasmodic cough—the most prominent symptom—so distressingly brought before them, they confine their energies more particularly to its removal or abatement.

Supposing the inadequate character of the present treatment be admitted, would we not be justified in adopting some other method of procedure, which would be founded upon a general principle having a more intelligible foundation than that of the past? Let us leave the cough and its cause for future knowledge, and devise some way of enabling the body to resist the tendency to debility, which means the tendency to death; as we cannot control the storm, or stop it at its source, we may put the ship in proper trim to ride it out.

Acting on this view, the method of treatment which I

would advocate might be called the "open air" treatment of hooping-cough; that is, in the treatment of any case of hooping-cough, to keep the little patient, as much as circumstances will admit, in the open air, in contradiction to the advice of authors on the treatment of this disease, where the contrary is recommended; as, for example, Dr Smith, in Reynold's "System of Medicine," who says, the patient should be kept at a temperature of 64°, and that the body should be kept perfectly quiet. Sir Thomas Watson also says, that "the patient in cold weather should be confined to an equable temperature, or protected by warm clothing, and care should be taken to keep the air equable. The air in the bed-room should not be colder than that in which the child has passed the day. It should not be much above, nor much below, 60° Fahrenheit." Other authors are equally plain and full in directing that the patient should be kept within doors; some of them indicate all seasons of the year. The full benefit of the "open air" plan can only be obtained by directing the patient to be out of doors, whatever the weather may be. Dr Aitken recommends change of air only as a last resource, when all other remedies fail; whereas, the "open air" treatment must be begun from the first. From its early use, we are less likely to require change to the sea-side towards the termination of the complaint.

The pathology of the disease sufficiently explains the action of the mode of practice I wish to introduce; and, as affections of the chest are of more frequent occurrence in hooping-cough than complications involving any other part of the body—in fact, we have few cases of the disease in which the chest is not involved, more or less—we may discard, for the present, the other secondary complications, as well as inquiries into the primary cause of the disease which is not yet determined, and notice slightly what takes place in the lung during the attack, and in this way satisfy ourselves that the "open air" plan of treatment is consistent alike with science as it is with experience.

The great characteristic of pertussis is the violent and

recurring spasmodic cough, which differs distinctly from the cough depending on irritation of the bronchial tubes, in so far as we have no local irritant in this disease, but depends on causes, we believe, totally separated from the lungs. Whatever the primary cause of the cough may be, it comes on in a completely healthy condition of the lungs. Dr Aitken says, and in this opinion I agree, that "inflammation is not necessarily found, although a state of the mucous membrane exists by which it is morbidly irritable or susceptible to impressions." By the recurrence of the cough, the lungs soon lose their normal state, and changes are induced which are not only caused by, but, when formed, also excite this peculiar spasmodic cough. We have thus an accumulation of material which acts as a local irritant, and is superimposed on the specific irritant of the disease.

The parts of the lung in which we are at present most interested are the ultimate divisions of the bronchial tubes, and the air vesicles themselves. The constant expansion of the cells at each inspiration, and their subsequent relaxation, facilitates and increases the onward current of the blood, and prevents it from becoming too sluggish for health. The oxidation of the blood reacts healthfully on the elastic tissues—as the blood, pure or impure, cannot avoid acting upon the neighbouring parts—and keeps them in tone and vigour, thus enabling them to discharge their functions with ease, and play their part in the proper purifying of the blood. The effect of the spasm of hooping-cough changes this condition of matters. On its accession we have tonic and forcible contraction of the fibrous tissues, brought on by the specific action through the nerves. This being kept up during the continuance of the cough, completely empties the cells of their air, tidal and residual; stops and delays the passage of the blood in the capillary vessels. The action of the spasm on the air cells in this way causes congestion of the blood-vessels of the lungs, and even retards the flow of blood supplied to nourish the air tubes themselves, because not only have we the spasm acting on the capillaries of the air

cells, but on those as well which supply the smaller bronchial tubes.

The effects of the spasm do not pass away instantly, nor are the proper functions of the part resumed immediately, as if they had never been disturbed. By an external examination with the stethoscope, shortly after one of the fits of coughing, we find evidence of congestion still remaining, and which will remain a longer or shorter time, according to circumstances. In other words, the effects of the spasm upon the normal condition of the tissue and minute parts of the lungs is—judging from results—of the nature of paralysis, though of a temporary character; at all events, the strength of the contraction brought to bear upon the minute tissue is so great that on the removal of the contracting force they are unable to resume their duties till they have regained somewhat of that tone which they had lost.

We know the result of congestion and relaxation throughout the other parts of the body. The same happens in congestion of the air cells and blood-vessels of the lungs. Blood ceasing to flow; relaxed tissues and exudation of fluid into the cavities of the cells and tubes. In this way we have those diseases of the chest which most frequently follow an attack of hooping-cough, bronchitis, pneumonia, emphysema, collapse of the lung, &c. Our object at present is not with the complications of hooping-cough, but to give the *rationale* of a style of treatment which, though it does not cure the disease, enables us to keep it in its simplest form—preventing complications—and lead it to a safe and satisfactory termination.

My recommendation in the treatment of the hooping-cough of children is to allow them every facility for being in the “open air;” to go on with their usual games, taking care in the cold weather to have them well and warmly clad, as is recommended by most authors; to romp about and enter into all the life and action usually characteristic of children, not stinting them in regard to motion, though this has been objected to by some writers as tending to cause an accession of the cough. In children too young to play without a

guide the patient ought to be carried out of doors, only using such precautions as would be taken with them in the usual state of health.

I have attended a child three years of age—well and warmly clad, no doubt—labouring under hooping-cough, who played about the streets in the cold, slushy, and snowy weather of last winter, without requiring to give the smallest particle of medicine, unless an occasional purgative. She would be seized with a cough in the midst of her play, and when the paroxysm was over, she resumed her game as if nothing had happened. In her case, there was no evidence of any approach to bronchitis or lung complication, unless immediately after the cough, when the breathing was found a little harsh, but which soon passed away, as if there had been no removal from the ordinary condition of health. This case was the first to call my attention to the treatment of hooping-cough by free exposure to the air. I watched it with interest, and the girl required no other treatment for three weeks, when the hoop was almost removed, and did not increase, although she was obliged to remain within doors from scarlatina, which she had caught from her brother, who was labouring under that affection at the time. This case also illustrates the impropriety of the advice given by Dr Smith, that, to prevent spasm, you should keep the body at perfect rest.

Last spring, I attended a child, about a year old, with an irritating cough, which ultimately terminated in the disease we are considering. The lungs, from having no abnormal sound on examination, passed gradually into a congested condition, and ultimately into well-marked bronchitis, having râles, both dry and moist. The eyelids took on the peculiar puffy appearance commonly seen in the disease, and the skin became clammy, &c. Notwithstanding the use of ordinary remedies, she was becoming gradually worse, when I asked the mother to take the child out for a stroll. This she did on a clear spring day, and repeatedly on the days following, after which the little one recovered so quickly that my subsequent attendance was limited to

one or two visits. It was remarkable in this case how soon the child lost the puffy character of the face ; and, on my visit next day, instead of lying weary and fretful, she was sitting on her mother's knee laughing, and interested in all that was going on among the other children. We cannot expect such rapid results in every case ; but, in other cases treated by this method, if the results were not so remarkable, they were, at least, as gratifying.

Considering what has been remarked previously regarding the action of the spasm upon the minute tissues of the lungs, we have the production of a debilitated condition of the parts surrounding, and commencing in the ultimate ramifications of the blood-vessels—including those supplying the bronchial tubes—and involving, to an appreciable degree, the strength of the whole system in its depressing effects, our first object in treatment, seeing we cannot check the disease itself, is to prevent the lungs and body generally from being so lowered in strength that the complaint can overpower the patient. In treatises on this subject, means to prevent weakness were recommended to be adopted towards the termination of the illness, instead of from the beginning. The treatment should be much that followed in fevers, keep up the strength, and treat complications. Hitherto, the treatment has been to attack the disease itself, as embodied in the cough, but, not knowing its nature, our efforts have been more or less useless. By putting the body into proper condition, and keeping it so—the disease itself not being necessarily fatal—it will be enabled to resist the extra strain put upon it by the hooping-cough. Practically, by giving the patient plenty of fresh air, and causing him to take exercise, he is receiving continuously tonic treatment. Any temporary depressing effect the disease may have on the body will be counteracted by the immersion of the body and lungs in this penetrating tonic fluid. Tonic medicine can only act fitfully, and by circuitous channels through the blood ; but the continuous application of the cold air bath—which is even applied locally to the affected tissues through the air vesicles—

keeps the bracing material in contact with the body, and with the parts more immediately weakened, at the time the depressing agency is at work. So soon as the paralysing power is removed, the tonic resumes its sway, and props up all the parts, till the return of the cough, when they are better able to resist, and not allow new complications to arise. It will thus be seen why it is not necessary to keep the little patient "quiet and still," to prevent the induction of the paroxysm. The cough will return at regular intervals, whether you keep the patient in one position or not, but if you allow no movement, and enforce the dwelling in a warm and unvarying temperature, you allow the effects of the spasmodic cough to have full sway, so that neither medicine nor food has power to check the increasing debility. By allowing unrestrained muscular exertion, and exposure to the tonic action of the air, you keep the body in a condition to resist those secondary results, and to bear up till the disease has run its course.

To state the management of hooping-cough in a few words, this treatment I would recommend at all seasons of the year, summer and winter. In the winter warm, in the summer, light clothing; nourishing and easily digested food; free exposure to the ordinary atmosphere, combined with muscular exercise when practicable; cold baths night and morning, with friction to the skin, the temperature of the water according to the age, &c.; and an occasional gentle purgative.

We can well understand—if the explanation of the action of hooping-cough given above be correct—how complications arise. An attack of catarrh, supervening on a simple case of hooping-cough, finds prepared and suitable soil for development into bronchitis, emphysema, &c. We have during the paroxysm of the cough congestion of the pulmonary and bronchial vessels, followed, on removal of the spasm, by relaxation of the tissues. The irritation arising from an attack of catarrh, supposing no other disease be present, causes congestion, with relaxation of the minute tissues; so that the lungs being brought under the influence

of both causes, it is simply a question whether we will have bronchitis or pneumonia. So also with the development of emphysema. Given a case of bronchitis or pneumonia, in which we have relaxation of the minute tissue, with exudation of fluid, which means weakened capillary vessels and cells, we have added to it the spasmodic cough, with its accompanying weakening effect upon the minute tissue, the result can only be, from such a double source of weakness, that the recurring cough is able to break up the tissue of the lung, and permanent emphysema is formed, should death not ensue. In keeping up the tone of the microscopic tissue, by the strengthening power of the air, you possibly avoid the complication altogether, or, if not, you put the patient into a better condition for overcoming whatever complication may be evolved.

No idea is entertained of holding up this "open air" plan of treatment as a specific in every case of whooping-cough, but it is one which, in the hands of a judicious physician, can be made of immense utility, and even in certain complications can be used with safety. Those who treat the disease on the principle of moderating the strength of the spasmodic cough, will find it a useful adjunct to any remedies they may think requisite for the treatment by the usual way.

We may believe that it was on the tonic principle that Dr Gibb found the nitric acid treatment of whooping-cough so successful, not from any specific action on the morbid poison which is at the root of the complaint. Nitric acid can only act through the blood, but how small a quantity can act on the debilitated tissues compared with an element which is always at work, and wraps the body in a health-giving embrace.

VIII.—CASES OF INTESTINAL OBSTRUCTION, WITH REMARKS ON OPERATIVE INTERFERENCE.

By WILLIAM LYON, M.D., F.F.P.S.G., late Surgeon and Lecturer on Clinical Surgery, Glasgow Royal Infirmary.

(Read before the Med.-Chir. Society of Glasgow, 3rd May, 1872.)

FOUR cases of intestinal obstruction having presented themselves to me within the last three months, and all having died, I have thought a statement regarding them, and discussion as to the best treatment to be practised, might bring out some points of interest and importance.

The first of the four cases occurred in a healthy child of four months. It had not, however, the great advantage of nature's usual nutrition, being partly supplied from the breast, and in part by farinaceous matters of several kinds. It became unwell on a Sabbath morning, vomited repeatedly, and moaned often. Castor oil, calomel, enemata, and latterly distention of intestine, by introduction of long tube and injection of tepid water, soap and water, castor oil, &c., &c., were frequently repeated, but all proved unavailing, and the child died on the following morning. Inspection could not be obtained.

The second case occurred in a boy of 5 or 6 years, a patient of Dr Whyte's. I think he was stated either to have suffered from a fall or from some weight having fallen upon him. At all events he had been seen by Dr Whyte the evening before I visited him, and had taken purgatives without effect. When I first visited him he had abdominal pain, distended abdomen, and quick pulse. It was agreed an effort should be made to procure evacuation by copious injection of soap and water with a long elastic tube, and if this proved unavailing, that he should have small doses of calomel and opium. I again visited him following morning with Dr Whyte, when his rapid small pulse, distended abdomen, and pallid aspect, bespoke approaching death. Post-mortem examination could not be obtained.

Case 3rd.—A few weeks ago I visited, with Dr Simson Buchanan, an elderly female, who had been suffering from obstruction of bowels for several days, in spite of laxatives, purgatives, usual enemata, copious injections of tepid

water by long tube, and latterly by free doses of calomel and opium. Those proceedings not succeeding, the propriety of surgical interference was discussed, but the age of patient, duration of symptoms, and the forlorn hope from abdominal incision, induced us to refrain. In two or three days after our decision, patient had a copious evacuation, and very soon died. No post-mortem could be obtained, but we were impressed with the probability that a compressing band of lymph had given way, and thereby permitted passage from the obstruction.

I recollect incising the ascending colon on a patient in the Infirmary, with such symptoms as those in patients above referred to. Free evacuations immediately followed, with great relief. But soon distention and all former symptoms returned, and the patient died. Examination proved that the symptoms had depended on a firm, broad band, extending across and compressing a portion of intestine. The explanation of the brief relief was that the free evacuation permitted relaxation of the compressing band, but that rapidly succeeding distention recurring, the fatal result followed. I think Professor George Macleod obtained from me a preparation evincing a very similar but less extensive band than that in the last case referred to; the band in this instance being from two to three inches long, and about the breadth of narrow tape. Had the distention been stronger, the band might have given way, and thus relieved the symptoms. Or had an operation been performed, speedy relief, and it may be recovery, would have followed.

While on this subject, I am reminded of a case occurring in a child of two or three years. The symptoms were vomiting, pain, and in right loin a slightly prominent tumour, accompanied with constipation of several days' continuance. I forget whether or not an operation was proposed; but another practitioner was called in, and I am unaware what the practice was. I have often regretted the non-performance of the operation in this case, as the locality of the obstruction was perfectly evident to eye and finger—a limited opening would have sufficed, and a favourable result might probably have followed.

The following melancholy case having very recently presented itself, has turned my attention and reflection to

what I may call continued obstruction of bowels, and has strongly impressed me. And, taking into consideration the large mortality from this form of disease, while abdominal surgery has so largely shown how that region may be exposed, and important organs successfully removed, in my very humble opinion the time has arrived when a new view of the subject can be rationally considered. Indeed, I am not quite sure but that surgeons have overlooked their ample frequent experience of the immunity from danger of hernial operations, in which the intestines not alone suffer from the pressure in strangulation, but also from exposure to the air and the manipulation to reduce them; and nevertheless the, in general, favourable result if undue time has not been permitted to pass. But still more striking facts have of late years presented, by the immunity from positive danger with which the abdomen can be exposed, and large and important organs removed, with frequent, I had almost said certain, favourable results.

In opposition to those views, I am quite aware I will be met by the statement that many cases of obstruction are relieved by natural efforts, some of them possibly by restoration of healthy peristaltic action; others by withdrawal of intussuscepted portions, or escape from mesenteric prolapse and rupture of bands, the products of inflammatory action; and, I doubt not, that from some of those and other conditions the efforts of nature now and again unexpectedly effect relief. And I hope the efforts of the surgeon are not always unavailing; but it is too well known they frequently are so; and it is my belief that in too much confidence of relief by nature, dangerous delay is permitted, and the chance from operation is lost. There is another difficulty in regard to the treatment of those cases. Some are acute, and consequently run a rapid course; in others, the pressure or other cause is not active—the medical attendant hopes, trusts, and delays, the time for interference has passed, and the patient of course dies.

In the case of the infant above referred to, death occurred

in twelve or fifteen hours; in the boy of six or eight years, in twenty-four; in the elderly female, in six or seven days; and, in the young man of fifteen years, in about a week; after much suffering and much unavailing practice.

I now come to the case of the young gentleman. I think he had been ailing two days before I visited him. He had vomited frequently, had taken laxatives and received numerous varied enemata. He had frequent abdominal spasms; abdomen was tense, and at right side, and below umbilicus, considerable pain on pressure. He was stated to have been amusing himself by reclining on his back, and attempting to displace boys sitting on his abdomen. To afford comfort and sleep, frequent subcutaneous injections of opium and belladonna were exhibited, and procured relief and sleep.

At this time, the third day, I think, of my attendance, the three first called gentlemen and I were joined by a fourth. All interference having proved unavailing, the patient suffering severely, the abdomen painful and tense, we thought ourselves driven to the extremity of taking into consideration surgical procedure. The procedure purposed was an incision to the right of, and below umbilicus, sufficient to permit entrance of hand, and exploration, in hope of feeling situation of obstruction. We were now joined by a fifth consultant, to whom three of our brother consultants adhered, and thus arrested the proposed procedure. The patient continued to suffer, was evidently weaker, and abdomen more tense and more painful; nevertheless frequent enemata were injected. To relieve tension, a hollow exploratory needle was inserted into two or three tense and prominent intestinal convolutions, but without further result than escape of a few air bubbles tinged with bile.

Further procedure was confined to alleviation of pain by subcutaneous injections of tinct. opii and belladonna. The patient continued to get weaker, and died on the evening of the 5th day of my attendance, which, I think, was the 7th of his illness.

Post-mortem examination was declined by the afflicted parents; but they latterly waived their objections, and two days after death an examination was made, all the consultants being present. A pretty long incision being made in the lower portion of the mesial line, the intestines protruded, and, being turned aside, exposed about the upper and posterior part of the sacrum, a dark-coloured portion of intestine about size of an ordinary plum or walnut. It appeared to rest upon a thin web of effused lymph, and was tightly surrounded at its base by a portion of lymph not thicker than the smallest thread, but nevertheless strong, and torn with considerable difficulty.

The performance of the operation was proposed, when the symptoms indicated that little, if any, peritoneal excitement existed; after all judicious treatment had failed to induce relaxation of bowels, and when it was evident that delay was every instant increasing the danger. More favourable conditions for the proposed operation will never present, and, while quite aware of the much to be feared danger, the state of parts disclosed by the *post-mortem* examination showed how easily the obstruction could have been reached and easily relieved.

I am quite aware of the hitherto unfavourable results of operations for relief of the various forms of intestinal obstruction; in first place, from the danger which attends exposure of the peritoneal surfaces, and which manipulation for the detection of the obstructing conditions necessitates; but there is now a strong conviction among surgeons, that delay permits inflammatory complications, which are further aggravated by prolonged use of purgatives. By those considerations, and also by reflection on the very favourable results of herniotomy and ovariectomy, when sufficiently early and judiciously performed, it is surely not unreasonable to anticipate a new and favourable era for abdominal surgery.

I am not forgetting the difficulties and dangers of exploring the abdomen in the search after the various forms of intestinal obstruction. But this very case which I have

detailed is one among many others proving that the obstructions may be easily reached, and if so, relieved too. For had an incision been made in the linea alba, and the operator's hand passed into cavity of pelvis, the globular form, and comparatively greater resistance which the obstructing portion gave to the fingers of the operator, would, and in fact did (at the post-mortem) conduct to the obstruction at once, and permit its facile release from the effused lymph on which it rested, and the thread like, but strong ligature which encircled it. I am not forgetting that the obstructions may be situated in portions and in positions much more difficult to reach and relieve than in this case; but it is a race for life, and, if need be, and a moderately small incision does not suffice for the needed exploration, a larger must be made, in the hope that as in ovariectomy, with the aid, it may be, of carbolic acid spray, success shall result. But an incision permitting entrance of the hand, and gentle exploration being thereby obtained, I think there is reason to hope for more favourable results than cases of intestinal obstruction have as yet afforded.

But I must remind you there are acute and rapidly fatal cases of intestinal obstruction, and there are others comparatively slow and less fatal, thus affording more favourable results to the patients and credit to the surgeon. At the commencement of this paper, I referred to four cases I happened to meet with a few months ago, all within a space, I think, of a few weeks, one dying within twenty-four hours from commencement of attack; another in about the same time; a third in four or five days, and the one mainly referred to in this paper, I think, in about a week. It was far from acute: and had the operation proposed been performed at the time recommended, there was certainly as fair a chance of success as can present in like circumstances. That the chance of relief and life was not afforded shall ever be a source of deep regret to me, and may, I hope, be a lesson to others not to lose the proper time for surgical procedure in the vain expectation of relief from nature.

In fact, there is little hope of success in acute cases.

They run their course rapidly, as shown in two of the instances referred to in this paper. I suppose this result is the consequence, mainly, of induced inflammation, which advances so quickly as scarcely to afford time for the ordinary means of relief—such as a very brief trial of purgatives and enemata, and, failing which, the use of opium to relax spasm, abate pain, and retard inflammation. The symptoms and consequent practice are very different in such cases as the one described in foregoing remarks, and afford opportunity for enemata, inflation—I dare scarcely say purgatives—but certainly laxatives, of moderate action; and, failing those, after a fair trial, and led by state of pulse, heat of skin, kind and degree of pain, frequency of vomiting, and, it may be, hiccup, the time for decision has, I fear, arrived for choice of delay, the hazard of operation, or the faint hope of dependence on efforts of nature.

I would almost say that at this point there is as much danger from delay as there is from procedure. Undoubtedly, the two children referred to in this paper lost their only chances from delay; and yet the delay was brief, say eighteen hours for the one, and twenty-four for the other. But I suspect few parents, and equally few surgeons, in the unsettled state of the question, would be inclined, the one to assent, and the other to operate. I shall therefore await the opinion of my hearers on these all-important points, and, in meantime, neither decide upon plunging into Scylla nor avoiding Charybdis.

I shall now briefly refer to the opinions and practice of surgeons on this important subject.

I first refer to Mr Brunton, who has written a very able and quite exhaustive volume on all forms of intestinal obstruction and their treatment. In the main, he urges mild efforts by laxatives and enemata; which failing, opium freely, with calomel moderately; but *if the obstruction arises from bands, diverticulæ, &c., gastrotomy, and division of the cord-like cause of strangulation.* I state, with regret, there is some inconsistency between his first stated views and his after recommendations; but his work is a very able one.

In Trousseau's Lectures on Clinical Medicine, Vol. IV., page 217, there are remarks very much in unison with the opinions I have expressed. He writes, "I admit, when we see surgeons, to search for and detach an ovary, making large openings into the abdomen with morbidly thickened walls, and the seat of great morbid changes, without taking into account the temporary contact of air with the peritoneum, and the horrible mutilations necessary for attaining the object desired, there need not be any alarm at the proposal to make a large incision in the linea alba, so as to enable the hand to be introduced into the abdomen, there to seek for, and destroy the obstacle, or to drag forward the particular intestinal convolution in which it is to form an artificial anus. It appears to me, therefore, that the undeniable success which has attended ovariectomy, would *justify*, for the cure of internal strangulation, recourse being had to an operation, which, though perhaps more calculated to excite alarm, is surely more rational and less dangerous than ovariectomy."*

In Vol. 31 *Medico-Chirurgical Transactions*, pages 32 to 35, inclusive, Mr Phillips says:—

"6th, That under ordinary treatment these cases of obstruction are fatal in the proportion of probably seven out of nine.

*7th. That though no reliance can be placed on purgatives on mercury, on opium, or any variety of injection, and that although in many cases they seem to aggravate the suffering, yet as it is unquestionable that in some cases they have been administered with relief, we cannot advise that they should be discarded, but we doubt the prudence of continuing them two or three days.

"8th. That the interference by surgical operation is justifiable when three or four days have passed without any relief from ordinary means, provided the constipation be complete, and vomiting of fecal matters continue, because it

* M. Trousseau relates several cases in which he successfully performed gastrotomy. See page 216, *et seq.* See also Nelaton, *Path. Chir.*, Tome IV., page 456, *et seq.*

affords a greater chance for the preservation of life than the ordinary means.

"9th. That if the indications as to the seat of the stricture be sufficient to satisfy the surgeon: it is at, or near that point that the incision should be made; but if there be much doubt, it is most prudent to make the incision in the median line.

"10. That if it be found impracticable to remove the cause of the obstruction, or imprudent to make any extended search for it, relief may be obtained by forming an artificial anus, as near as may be prudent to the seat of the obstruction; and that if it be, as it frequently is, near the termination of the ilium, an incision on the median line admits of its accomplishment as near as may be to the termination of that intestine." *

I think those cases, and the opinions of the authors quoted, go far to establish that, where the symptoms of obstruction are of acute character, the patient suffering severely, the skin hot, the pulse rapid, the distension great, the vomiting frequent, and a full and active use of laxatives, assiduously, but not strongly employed; and those, aided by large, but non-stimulating enemata, still prove unavailing; the contrary practice of abating pain and procuring relaxation, by calomel and opium, may have a trial, but a brief one; and those failing, but led by judicious consultation, and state of the patient, there only remain continuance of the treatment, recourse to operation for formation of artificial anus, or incision in *linea alba*, exploration of abdomen, and relief of obstruction by hand of the surgeon.

More time may be permitted if the symptoms are of less acute character than stated above; but a rapid change, as in the cases first described, may suddenly supervene, and frustrate all operative procedure.

I confess it is an important, difficult, and responsible point

* See also Report of a case of intestinal obstruction, by Mr Druitt, in "Medico-Chirurgical Transactions," Vol. 31, p. 247, *et seq.* Case of intestinal obstruction relieved by operation, by Mr Hilton in Vol. 30, "Medico-Chirurgical Transactions," pp. 51 and 52. Guy's Hospital Reports, 1844, p. 391. "British Medical Journal," March 23, 1872.

to decide; but the four cases which so recently presented to me prove the danger of delay and consequent loss of all hope of recovery.

I can readily conceive that strong objections may be founded on, it may be, the difficulty, or even the impossibility of detecting the cause of the obstruction by the hand introduced into abdomen. But suppose we fail in detecting the locality of the obstruction, there remains the dernier ressort of securing a portion of distended intestine, attaching it securely to the incision in abdomen, and then forming a sufficient opening for the escape of the contained fæces.

ADDENDUM.

Since reading the above paper, I have seen three cases of obstructed bowels, of which the following notes may be interesting:—

On May 12th, 1872, I saw, with Drs Eadie and J. Wilson, Miss ———, aged seven or eight years, who, two days before I visited her, had frequent vomiting, considerable abdominal pain, was very restless, and, to move bowels, had taken frequent doses of calcined magnesia, and many soap enemata. Pulse varied from 80 to 100. The abdomen was but very slightly swollen, if at all, and only slightly painful over course of colon on left side. It was agreed she should have doses of calomel and opium, and fomentations over abdomen.

Following day (being, I think, the third of her illness), there was little difference in the symptoms or her condition. If any difference, however, conditions were somewhat aggravated. It was agreed by all the attendants that as large a quantity as possible of tepid water, containing soap, should be injected by a long flexible tube. The tube was passed, and its point could be felt at the upper and left part of abdomen. The quantity injected was about two English pints, and was prevented, by pressure, from escaping for ten minutes or so, after which it passed off, tinged with, and slightly smelling of, fæcal matter. Upon evening of

same day, symptoms were unaltered, and a second, but much smaller, enema of former kind was injected.

The general symptoms continued unchanged, causing all concerned much fear and anxiety, and the necessity of surgical interference was mooted, considered, and prepared for. But now the patient vomited less frequently, suffered less, and gradually, though slowly, amended; and, upon the tenth or eleventh day from the commencement of illness might be said to have recovered.

I have already called attention to the very different degrees and forms in intestinal obstructions—some being acute, and running their course in very brief time; others, like the one referred to in present instance, being less severe, and consequently of longer duration and more favourable termination. Much care was taken in this instance, at least not to do injury by active and energetic interference, and thereby aggravating inflammatory action, so much to be dreaded. A fair trial, therefore, having been given to laxatives and enemata without benefit, they were then exchanged for calomel and opium, in such doses as to abate suffering, relax spasm, delay inflammation, and possibly procure relaxation of bowels. In the case above related, the desired results certainly occurred; but, whether or not from the treatment, may be disputed.

More recently I have attended in consultation two cases of obstruction—one of them a boy, patient of Dr Patrick, Bridgeton; the other a strong man, of forty or so, patient of Dr Mackay, High Street. In both instances the cases were acute, and had existed in case of the boy five or six days, in the man four or five. All usual practice having failed, it was proposed to carry up the injection tube until it could be felt as in the case of the girl at the flexure of colon on left side; and that a large and strong mixture of yellow soap and water should be injected, and retained by pressure as long as possible. In each case relaxation, and ultimate recovery followed, a result referred to the great distension and peristaltic action excited by the very copious soap enemata. Whether those two cases were dependent on displacement,

obstruction, or deficient action, and whether or not the relaxation was the result of the treatment, I will not presume to assert.

Reflection on the different forms and causes of above cases urges me to inquire whether information of the seat of obstruction, or its causes, can in any manner be ascertained and removed by use of the stethoscope, palpation, or position. If there should exist increased peristaltic action by nature to overcome the obstruction, might gurgling not be heard by the stethoscope, or dulness ascertained by palpation or tympanic distension? Or, might displacement be removed by dependent position of the head, chest, or abdomen, and thereby involution removed? It may be said the erect posture would be equally useful; but would not the dependent be preferable, as the weight thrown on the diaphragm would permit enlargement and weight to tell? I fear, however, information and relief from any or all of these are very problematic. A very exhaustive article on the symptoms, causes, and diagnosis of intestinal obstruction will be found in the able *Outlines of Surgical Diagnosis*, by Professor George Macleod.

IX.—SHORT COMMUNICATIONS.

1.—THE EFFECT OF FEAR ON A BOY. *Communicated by* DR WILLIAM MACEWEN, *Glasgow.*

IN the last number of the *Glasgow Medical Journal* a very interesting case was given of the "Effect of Fear on a Canary;" I beg to furnish, as somewhat analogous, a case of the effect of fear on a boy.

On the 5th January, 1872, I was asked to see a boy, about 14 years of age, who had been taken into the Police Office, under the following circumstances:—He and another boy had been fighting on the street, and were surrounded by a crowd; and so intent were they in their engagement, that they did not notice the advent of two policemen, one of whom caught this boy by the collar, admonished him for his conduct, and told him to be off. The boy, however, stood motionless, with his arms still in fighting attitude, and eyes intently gazing at the face of the policeman. Seeing this continue, the constable conveyed him to the Police Office. On his road thither, his eyes were not diverted for a moment from the face of the policeman.

When I saw him he was still in pugilistic attitude, with his head and

chest thrown well back, and his arms at the guard. His eyes were riveted on the policeman, and his countenance bore a look of abject terror. His arms, head, and neck were in a cataleptic condition; but when the policeman shifted his position, the whole of the boy's body moved puppet-like, so as to keep the policeman within visual range. When he was made to walk, his lower extremities seemed to move automatically. He was unconscious of all external impressions. His pupils were normal, pulse about 100, and respirations were scarcely perceptible.

He was taken into a room at hand, and the cause of his trepidation removed. As the policeman made his exit, the lad's eyes followed him to the door, and remained fixed on vacuity after he had gone. Everything was kept quiet, and calmative measures were resorted to. At the end of ten minutes his countenance gradually lost its rigidity, and gave place to a silly, expressionless grin. About half-an-hour after this, the spasmodic condition of his arms, head, and neck relaxed, and he soon after regained his senses.

For some little time he looked about confusedly, and then asked where he was. He remembered having been fighting, but did not know that he had been taken to the Police Office. He complained of headache and somnolence, but after half-an-hour's sleep, went to his own home quite well.

The possibility of shamming in this case has been suggested by a medical friend, but I cannot take this view. A boy may counterfeit headaches and such simple matters while at home and tended by over-indulgent parents; but it would require a person of more mature years to carry out, even a practised feigning, before crowds of people and in front of the grim dignity of police officials. Malingerers are generally found in the lower strata of society, or among those whose mental and moral tone has been depraved. But this boy was by no means a Street-Arab (a class which malinger sometimes), on the contrary, he was very respectable. Then malingerers do not dissemble without a special object, but this boy had no object to cause him to simulate. He was not brought up on any "charge," but merely because he had fallen suddenly into what appeared to the constables to be an unconscious condition. Had he wished to get away, he was free to go. It would require a stretch of imagination to believe that he dissimulated for the purpose of being brought to the Police Office, and that could have been his only object in malingering. Then the state was not assumed after deliberation, but instantaneously,—at the first sight of the policeman. He seems to have been under violent excitement at the moment, probably in a paroxysm of rage at his opponent, and while his mind was in this over-stretched condition, he suddenly found himself in the firm grasp of "that terror to evil doers" (especially juvenile ones), and this produced a shock to these already over-strained parts, from which they recovered only after a time. It is possible that had this boy's mental powers been weaker, some permanent impairment might have taken

place, as there are cases in which sudden and violent emotions have produced insanity. At the present time, there is a woman under the care of Dr Robertson, in the Town's Hospital, who, as far as *fear* is concerned, became insane under circumstances very similar. She was about to be married, and in this way probably had her mind fully occupied; when, as she was standing in the middle of a room on the ground floor of her mother's house, a man who was passing on the street thrust a singed sheep's head close to the window pane. She screamed, and her screams brought her mother, who found, after she got her quieted, that her mind was completely deranged, and it has remained in that state up till this time.

As to the cataleptic condition: however predisposed I was to consider it sceptically, yet there was no doubt about the intense rigidity of the muscles, and it appeared to be involuntary.

2.—CLINICAL MEMORANDA, by DR M'CALL ANDERSON, *Professor of Practice of Medicine, Anderson's University; Lecturer on Clinical Medicine, Royal Infirmary, Glasgow.*

No. VI.

Case of Aneurism of the Aorta.

John C——, æt. 40, unmarried, a shoemaker by trade, was admitted into the Glasgow Royal Infirmary on 15th June, 1872. His family history was not bad, his father having died at 65—said to be of debility—his mother of cholera, at 50, and his only brother having been drowned; his diet had been always good, but his habits were from time to time irregular.

When a young man, he suffered from palpitation, which was ascribed by his medical adviser to bathing too often in the sea. He enlisted to the 42d Highlanders, and joined his regiment in the West Indies, where he had repeated attacks of "liver complaint" and dysentery, and one attack of Asiatic cholera. He also suffered from ophthalmia, which was very rife in the regiment (420 men having been attacked.)

For four and a half years he was quartered in Bermuda, and after that at Halifax, where he enjoyed excellent health. During the Crimean campaign, however, he had repeated attacks of dysentery. He was afterwards in India during the Indian Mutiny, when, with the exception of slight attacks of ague, he remained in good health, and in 1870 he was discharged on full service pension, and became a shoemaker.

In the middle of April 1872, he began to complain of severe pains in the left side, below the floating ribs, which confined him to bed for fifteen days, and from which he partially recovered under medical treatment. On the 4th June, however, it became as bad as ever, so that he was obliged again to take to his bed.

On admission into the Hospital on the 15th, his only complaint was of severe pain in the left lumbar region, extending over the hip and shooting down the leg. Owing to the pain he had great difficulty in turning or

moving, and he inclined to sit up in bed supported by pillows, as this posture gave him most relief. My assistant who examined him, in my absence, reported that the internal organs were healthy. He derived some relief from the use of fomentations, and from the subcutaneous injection of morphia.

On the 29th June, after partaking of his evening meal, he fell asleep, and at 9.30 P.M. was found dead by the nurse.

The *post-mortem* examination was made by Dr Coats on the 2d July. The surface of the body was extremely pallid. The internal organs were pale, and the heart, which seemed to be quite healthy, was almost devoid of blood. The aorta, throughout its whole length, was extremely atheromatous, and, on a level with the diaphragm, a large aneurism was detected, which was partly within the thorax, but principally in the abdomen, and which communicated with the aorta by an elongated aperture in its posterior wall $2\frac{1}{2}$ inches long, and about $\frac{1}{2}$ an inch broad, its margin being very irregular. It projected about an inch to the right of the middle line, and three or four inches to the left.

At the upper part of the aneurism which projected into the thorax an aperture, about the size of a fourpenny piece, obstructed by a clot of blood, and which communicated with the left pleural cavity, was discovered. This cavity contained an immense quantity of blood, the solid clot, apart from serum, weighing 1 lb. 12 ounces. The left lung was much compressed, but otherwise normal. The right lung was healthy, but firmly adherent.

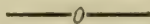
At the lower part of the aneurism, at the left side posteriorly, and below the diaphragm, another orifice was detected, which communicated with a large quantity of coagulated blood situated between the peritoneum and the abdominal walls. This coagulum stretched from the diaphragm to Poupart's ligament and spread behind the kidney where it formed a thick layer. The anterior surface of three or four of the upper lumbar vertebrae were markedly eroded. The liver was fatty, the kidneys anæmic, and the spleen rather larger than usual.

This case is at once unusual and instructive. The situation of the pain, in the lumbar region, and its character, aggravated by exertion and relieved by certain postures, are just such as might be expected in a case of abdominal aneurism. But, apart from the pain, no other symptom of such a condition was detected. This is the less surprising when we find that it was so high up and so deep seated.

It is very uncommon to meet with an aneurism projecting partly into the abdominal and partly into the thoracic cavity, nor is it usual, although such cases have been recorded, for it to burst both into the pleura and into the retro-peritoneal cellular tissue.

There can be no doubt that the cause of the pain was the pressure upon the nerves, and perhaps, in part, the erosion of the vertebrae, while it is equally certain that the patient died of syncope, the result of rupture of the sac.

Reviews.



- I.—1. DIE CELLULAR-PATHOLOGIE, IN IHRER BEGRÜNDUNG AUF PHYSIOLOGISCHE UND PATHOLOGISCHE GEWEBELEHRE. *Dargestellt von* RUDOLF VIRCHOW. Vierte, neu bearbeitete und stark vermehrte Auflage. Berlin. 1871.

THE CELLULAR PATHOLOGY, ESTABLISHED ON THE BASIS OF PHYSIOLOGICAL AND PATHOLOGICAL HISTOLOGY. *By* RUDOLF VIRCHOW. Fourth, new and much enlarged Edition. Berlin. 1871.

2. AS REGARDS PROTOPLASM. *By* JAMES HUTCHISON STIRLING, F.R.C.S., and LL.D., Edinburgh. New and improved Edition, completed by addition of Part II., in reference to Mr Huxley's Second Issue, and of Preface in reply to Mr Huxley in "Yeast." London. 1872.
3. PROTOPLASM; OR LIFE, MATTER, AND MIND. *By* LIONEL S. BEALE, M.B., F.R.S. London. 1870.
4. DISEASED GERMS, THEIR REAL NATURE. An Original Investigation. *By* DR BEALE. London. 1870.
5. DISEASED GERMS, THEIR SUPPOSED NATURE. An Original Investigation, with Critical Remarks. *By* DR BEALE. London. 1870.

IN passing under review the treatises whose titles appear above, we do not propose to give a detailed and critical analysis of the individual works; but, rather, taking these as somewhat representative of modern views on the subject, we intend to make some remarks on the so-called "Cell-theory," and direct especial notice to some of its more recent aspects, as manifested in the writings especially of Beale and Huxley.

In considering the cell-theory, as it is called, we may, perhaps, arrive most safely at a conclusion as to its significance, by considering, in the first place, how the idea which the word expresses has arisen. To go back to John Hunter, we find in his writings how, time after time, he repeats the assertion, that each individual part of the animal body is endowed with a separate life. This idea he expresses in one place in these words, and they are certainly sufficiently distinct, "Every individual particle of the animal matter, then, is possessed of life, and the least imaginable part which we can separate, is as much alive as the whole." And to explain more fully his meaning, he compares his idea with the more prevalent opinion. "The principle of life," he says, "has been compared to the spring of a watch, or the moving power of other machinery, but its mode of existence is entirely different. In a machine, the power is

only the cause of the *first* action or movement, and thereby becomes the remote cause of the second, third, &c.; but this is not the case with an animal; animal matter has a principle of action in every part, independent of the other, and whenever the action of one part becomes the cause of action in another, it is by stimulating the living principle of that other part, the action of the second part being as much the effect of the living principle of that part, as the action of the first part was of the living principle in it." Hunter, in his investigations on Inflammation, developed this principle more particularly in reference to the blood. He taught that this fluid has life in itself—is not merely a vehicle for conveying nourishment to the tissues, but is in reality a tissue itself, and this none the less that, for convenience of distribution, it is in the fluid form. He showed that, when blood is effused within the living body, it may, under certain conditions, show signs of vitality, the clot which is formed having been observed by him to develop in some cases into a vascular tissue.

In order to account now for this fact of the independent vitality of every smallest portion of animal matter, Hunter devised a hypothesis, which also might be taken as a kind of prophesy of the now much-talked of protoplasm. He supposed that the principle of life which is thus universally distributed in animal matter is a property inherent in a particular variety of animal matter. This form of animal matter he supposed to be diffused through the blood and all the tissues, but to be particularly abundant in the brain. In the blood, Hunter supposed this peculiar substance to have its residence in the coagulable lymph more than in any other constituent, the coagulation of the lymph being one of the first manifestations of life in the blood. To this coagulable lymph Hunter ascribed functions of very great importance. He conceived that in those cases in which, after blood has been effused, organization of the clot ensues, it is the lymph which is chiefly concerned in bringing about this result. But, further, the blood-vessels, he considered, had, under certain conditions, the power of effusing the coagulable lymph without the other constituents, and that the lymph thus thrown out had the power of becoming organized, developing into a tissue corresponding to that on which it was thrown out. In this view he made coagulable lymph play a most important part in the formation of new growths such as occur after inflammation, or such as tumours. He conceived that in all these cases, even in cancerous growths, the first step was the

effusion of lymph, and that the lymph afterwards tended to organize, always, however, with the inclination to assume the form of the tissue into which it was effused.

After the discovery of the cell form, and after it had been shown, especially by Schwann, that the animal cell is quite analogous to the vegetable cell, the views originated by Hunter naturally underwent considerable modification, though we can still for some time trace the influence of his ideas. The plastic lymph of Hunter gave place to the blastema or cytoblastema. This substance had not the power of itself becoming organized, but deposited in its midst the cell form. Schwann considered that this formation of cells within the cytoblastema was analogous to the formation of crystals in their mother-liquor. He supposed that while inorganic matter tends to fall from its solutions in the form of crystals possessing distinct mathematical forms, animal matter tends to fall from its solutions in the cell form. He even went on to describe the supposed process of deposition, first a minute granule appears which forms the nucleolus, and it has the power of attracting matter to it in different layers—first the nucleus, then the cell contents layer by layer, and finally the cell membrane; the process being analogous to that of crystallisation, where the first small crystal grows by deposit in layers of the dissolved substance. In this way the origin of the animal cell was sought to be accounted for; and now, when the various animal tissues were subjected to a thorough analysis, it was found that this cell form recurred under various modifications in each of them. In most of the tissues, however, the cellular elements are separated from one another by an intercellular substance, and this was looked on as the remains of the cytoblastema from which the cells were deposited.

In the hands, especially of Virchow and Goodsir, the position became very materially modified. It had been said that the cytoblastema deposited the cells, that the cells are therefore secondary productions. Virchow now says that the cells are primary, and the intercellular substance is produced from them. Looking at the origin of the tissues in the embryo, it is found that originally we have simply aggregates of cells, and of cells which present very little differences among themselves. It is by the modification of these, which may be called indifferent cells, and by the production between them of intercellular substance of various kinds, that the individual tissues are produced. And the cells which we find in the mature tissues are not therefore deposited from

the intercellular substance, but are really the lineal descendants of the cells of the ovum, the intercellular substance being a secondary product resulting from the action of the cells themselves. And while so much stress is laid on the cells in the formation of the tissues, they are regarded by Virchow as playing a no less important part in the mature tissues. He considers that the cell, from its origin onwards, has an independent vitality, and that throughout its life it retains this independence; and as in the course of the development of the tissues the cells in the greater number of cases form around them an intercellular substance, so throughout life do these same cells continue to superintend, as it were, the nutrition and functions of this intercellular substance. The intercellular substance belonging to each cell he thus distinguishes as its territory, the whole body being thus made up of comparatively independent cells with their cell territories. By Virchow, therefore, the body has been compared to a free state, composed of equally independent individuals.

And here it will be observed how wonderfully this principle attaches itself to the views held by Hunter. He considered that there was a principle of life in each individual particle of animal matter, and "the least imaginable part which we can separate is as much alive as the whole." Virchow might say that it is in the cell that this independent vitality resides. So, too, Hunter says that "animal matter has a principle of action in every part independent of the other, and, whenever the action of one part becomes the cause of action in another, it is by stimulating the living principle of that other part." And it might be answered yes; and when the stimulus is conveyed from one part to another, it is the cells which react to that stimulus, and their action is as much the result of their vitality as the action of the other part was of its. When, for instance, a stimulus is conveyed through the nerves to the muscle, the resulting contraction is not the direct result of that stimulus, but the stimulus simply wakens up the contractility of the muscle cells.

In this way, the two principles of Virchow's position may have become clear. The first of these is expressed in his aphorism *omnis cellula e cellula*, all cells are derived from mother cells; and the second is exhibited in his comparison of the animal body to a free state, composed of mutually independent members. That is to say, no cell within the animal body arises *de novo*, but each one is derived from its

parent cell, and the cells so formed have, like the parent cell, an independent vitality, each one performing the offices of nutrition, function, and reproduction for itself and by itself.

Having thus briefly sketched the position of the cell theory, till it has reached, as we may say, its highest point of development, it remains to consider how more modern views have tended to modify this position, or how various observers have viewed the subject. Perhaps we may best effect this object by considering the meanings attached to two words which have in their day been subjected to quite an unusual amount of misuse; these words are, *protoplasm* and *bioplasm*.

In nothing is the independent vitality of the individual cells more manifest than in the power of independent motion which many of them have been found to possess. This peculiar power was first discovered in certain animals very low in the scale of life. In these animal forms there is a substance which has the power of contracting and expanding, and by these means altering its shape in manifold ways. This substance, to which the name of sarcode was originally given, in many lower animals, subserves locomotion. In the rhizopods, for example, processes are shot out by the sarcode, and by means of these processes the animal moves along. Typically is this seen in the amoeba, where the whole animal seems simply a mass of sarcode, and the entire body is capable of altering its shape, sending out blunt processes according to its requirements. But it was not long before it was discovered that this peculiar contractile power is not confined to the bodies of these lowest animals. It was found that in certain animals the elements of the impregnated ovum present a contractility quite similar to that described. Then the white blood corpuscles were soon found to possess a similar power; they were observed to alter their shape, and shoot out processes in a manner exceedingly like the amoeba. The motion of the vibratile cilia was also accounted for by the presence in the epithelial cell of a substance possessing contractility essentially similar to that of the so-called sarcode of the rhizopods. But the observation was carried still further. The cells of almost every tissue in the body have been found to contain a substance which possesses this peculiar power of contractility. It has been observed, as already mentioned in the white blood corpuscles, in cartilage corpuscles, in the connective tissue corpuscles, in the corpuscles of the cornea, in the walls

of capillary blood-vessels, and in other parts, till it has now become the prevalent opinion that in almost every living cell there is a substance possessing this contractile power.

At first, this contractile substance, or sarcode, was regarded as something belonging to many cells, but was not essentially identified with the cell itself. But first, by Max Schultze, and afterwards by most others, this contractile sarcode came to be recognised as identical with the contents of the cell, as an essential constituent of the cell. And now it became necessary to indicate this new position by an alteration of the nomenclature. The contractile substance is no longer a sarcode simply pertaining to the cell, but must now be looked on as one of its essential constituents, and for this purpose the name protoplasm was borrowed from botany. The animal cell has been throughout the discussion compared to the vegetable cell, and sometime previously Mohl had distinguished as protoplasm in the vegetable cell, the colourless viscid granular material which was supposed to be the formative substance. The analogy was then again renewed, and the contractile sarcode of the animal cell became its protoplasm.

To understand the significance which is now attached to this so-called protoplasm, it may be useful to recur to the condition of matters in the ovum. In the ovum we have the animal structure reduced to its simplest elements, and we have also the original stock from which all the tissues of the body are derived. The impregnated ovum, at the very outset of the changes which it has to undergo, divides into a number of cells, and it is these cells which may be looked on as the forerunners of all the cells in the animal body, as the typical original cells. Now, these cells present, on microscopic examination, the appearance of granular viscid semi-transparent masses, containing each a nucleus. The original cell is, therefore, in the words of Max Schultze, a mass of protoplasm containing a nucleus. But the cell so constituted has in itself the power of carrying on an independent life, nourishes itself, has probably contractile power, and produces a second generation of cells. When we pass now to the examination of the fully developed tissues of the body, we find in almost every case that, though the cells do still possess some of this granular protoplasm, yet that this is in some measure replaced by other forms of animal matter. The granular protoplasm may be, in some cases, completely replaced by other substances, as, for instance, in the red blood corpuscle, where a transparent albuminous substance,

globulin, coloured by hæmatin, composes the cell; or again, in the case of the flat epithelium of the epidermis, and many mucous membranes, where the protoplasm is replaced by a firm dry substance named keratin. Such cells as these are no longer capable of further development, cannot produce new cells, are for most purposes devoid of vitality. But such cells are the exception. In most cases, even in the fully developed tissues, the cells still retain some of this granular, presumably contractile protoplasm, though, as already mentioned, this is, in most cases, partially replaced. Thus we have fat, pigment, and other materials deposited in the protoplasm. It seems as if the protoplasm of the cell then were a kind of index of its powers. We have first the cells of the ovum with the power of forming the whole future tissues inherent within them, and these are composed of masses of protoplasm with a nucleus. Then, as development proceeds, these cells become differentiated, and, losing more and more of their protoplasm, get into a more and more fixed state, till, finally, we have at the opposite pole the epidermic scale, which has lost all its protoplasm, and merely acts as a mechanical protection.

There is, in the adult body, a class of cells, which exhibit still a marked resemblance to the cells of the ovum, in respect, especially, that they present the appearance of a mass of protoplasm with a nucleus. These cells are typically represented by the white blood corpuscle, which, in accordance with this fact of its structure, seems much more than almost any other structure in the body to be possessed of a certain independence. It is well known now that the white blood corpuscle possesses a power of contracting its substance, by means of which it is able to alter its shape, and, by shooting out processes, which act as temporary organs of locomotion, to move from place to place. It is also now pretty well established, that the white corpuscle can, by means of this contractile power, find its way through the walls of the blood-vessels, and, passing outwards, enter on an independent career. Pus corpuscles, which are in some part at least white corpuscles, which have thus escaped from the vessels or their descendants, have a similar power, and they, too, present a similar structure.

These facts, then, in respect to the protoplasm of the animal cell seem to supply a very strong confirmation of the cell theory. It is definitely proved that cells can carry on a most independent existence—can even leave their usual seat, and, if circumstances are congenial, continue to live in another locality. It

appears that almost every cell has a certain amount of this contractile protoplasm, and partakes, therefore, in some degree, of the independence of those which have it as their essential constituent. The cell, therefore, still remains the morphological unit in the animal tissues, albeit the views as to its structure have undergone some modifications.

By a most wonderful perversion, however, this very protoplasm has been used by one writer in such a way as apparently to subvert the entire cell theory. And, as in this country the term itself is perhaps most familiar through that well-known essay, it may be useful as briefly as possible to inquire how this has come about. The line of argument may be represented somewhat as follows:—This substance, protoplasm, is present in almost all cells—is, as it were, an evidence of their vitality. Then this substance connects all cells together; brings them into a kind of unity. The cells of the connective tissue are not very distinct from the cells of bone; both contain protoplasm, let us say the same protoplasm. But again, the protoplasm of man does not differ from that of the lower animals, and that of the lower animals does not differ among themselves, at least, in appearance. So that protoplasm is one in nature and functions throughout the animal kingdom. But, further, we find a substance of similar structure and functions in plant cells. Here, also, appears the omnipresent protoplasm, and the generalization is carried a step further; and it is asserted that the protoplasm of all plants and animals is the same in structure, composition, and functions. The conclusion is obvious, that we have here a universal basis of life. Wherever life is, there is protoplasm; and, *per contra*, life is but a function of protoplasm. From this the subversion of the cell theory is an easy step. If we had a large mass of protoplasm, we should there have a living mass of protoplasm. It is in no way necessary that the protoplasm should be in cells; it is not necessary that it should be in isolated pieces at all; the cell is not in the least a necessary form; everything depends on the presence of protoplasm and its power of contractility. By a very remarkable progression, Mr Huxley passes even beyond this position, and the steps in his progression are by no means obvious. The cell-form being subverted, and the all-important protoplasm set up as the universal basis of life, he says that every living being is simply a mass of protoplasm. He seems to make no distinction of skin, flesh, or bones, all is protoplasm, and all is the same protoplasm in every animal.

Those vagaries of Mr Huxley have received from Dr Beale, and especially from Dr Hutchison Stirling, a very sufficient

answer. We shall not attempt here to reproduce their arguments. The following quotation from the preface to Dr Stirling's pamphlet puts the matter in a nut-shell:—

“If the question involves at bottom logical issues, it has been really addressed by Mr Huxley to physiological ones; and it is only in the interest of scientific accuracy to point out that the inference to a physiological identity has been attempted to be made good by Mr Huxley, solely through means of an unwarrantable tramping out of—perhaps, for the moment, involuntary blindness to—the most essential physiological differences. For example, if you *identify* all life in protoplasm, the counter-reminder is only fair, that you must equally *differentiate* all life in protoplasm; for, of no one living thing, and of the organs of no one living thing, is the protoplasm interchangeable with that of another; and this involves, instead of Mr Huxley's *identity* in power, in form, and in substance, infinite difference in all these respects.” (p. 4.)

The protoplasm of the ox never produces the protoplasm of the sheep, or any other protoplasm. Protoplasm does not occur in indiscriminate masses—animals are not made up of heaps of homogeneous protoplasm—but it does occur in every case as a constituent of the cell; that is to say, as a constituent of a minute entity which possesses a quasi-independent existence. It is therefore by an obvious fallacy that this protoplasm has been used to subvert the cell-theory.

We may now turn to another view of the subject, which has also been recently brought forward by an English author, and consider the ideas of Dr Beale, under the designation which he has recently introduced into his system—that of bioplasm. It may be remarked, at the outset, that these views of Dr Beale seem to agree, in most respects, with those already described as involved in the cell-theory itself. There are certainly some differences, but in essentials there is a fundamental agreement; and it is therefore perhaps to be regretted that Dr Beale considers his own peculiar views of sufficient importance to require a new nomenclature.

The term bioplasm, as now used by Beale, is substituted by him for the expression “germinal,” or “living matter,” which he formerly employed. According to him, if we examine any portion of animal tissue we find in it matter in three forms—first, living matter; second, matter formed from this; and, thirdly, pabulum which the living matter takes up. When we come to inquire into the characters ascribed to this living matter or bioplasm, we find that it alone is supposed to be “concerned in development; and the production of those materials which ultimately take the form of tissue, secretion, deposit, as the case may be. It alone possesses the power of growth, and of producing matter like itself out

of materials differing from it materially in composition, properties, and powers." Again, Dr Beale says:—"One characteristic of every kind of living matter is spontaneous movement. This, unlike the movement of any kind of non-living matter yet discovered, occurs in all directions, and seems to depend on changes in the matter itself, rather than upon impulses communicated from without." Then, again, speaking of the development of the animal tissues, the following expressions are used:—"In the formation of man and the higher vertebrata, the primary mass of bioplasm or living matter absorbs nutriment, and grows, and then divides and subdivides into numerous masses, which are arranged in a definite manner." Dr Beale also supposes that all the bioplasm which is found in the adult tissues is related to this original bioplasm of the embryo by lineal descent, no new formation taking place except by the subdivision of the masses of bioplasm already existing. In respect now to the second form of animal matter, the so-called "formed matter," Beale considers that this has in every case been previously in the state of living matter or bioplasm. The original masses of bioplasm, in the process of formation of the various tissues, become, at their peripheral portions, converted into formed matter of various kinds, according to the tissue which is in the process of formation. If we examine, for instance, the epidemic surface of the skin, we find at the deeper layers that there are simply masses of bioplasm; but as we proceed towards the surface this bioplasm gives place more and more to formed material, till on the very surface the entire bioplasm has been converted into formed material. To Beale, then, the entire animal body is made up of these constituents:—In the first place, innumerable minute masses of bioplasm, each of which has independent vitality, supports itself, absorbs nourishment, grows, and may reproduce its like, but which also tends to be converted into formed matter. This second constituent is, to all intents and purposes, dead; it has no power of independent motion, cannot increase in size, cannot reproduce. The third constituent is the pabulum or nutritive material, which is made use of by the bioplasm. Beale, therefore, also looks on the body as in some measure a free state, made up of mutually independent units; but these are units of bioplasm, and he refuses to call them cells. These units are, as it were, the architects of the bodily tissues, building up the structures in a manner comparable to that in which the coral reef is built by its myriads of polypes, and he regards the formed material of the animal

body as in many respects as dead as the corallum of these animals.

If, now, we compare these views of Dr Beale with the more prevalent ideas, we shall find that his bioplasm is, to all intents and purposes, the same as the protoplasm of other authors, *plus the nucleus*. Bioplasm, like protoplasm, is capable of spontaneous independent motion; it is, in fact, the evidence of life in the tissue. But though Beale acknowledges that the bioplasm is arranged in masses, thereby giving expression to an idea essentially one with that at the basis of the cell-theory, yet he refuses to give any very special significance to the cell form as commonly understood. We have seen that, according to the usual view, the body is divided into cells and intercellular substance, the cells in most cases containing a certain amount of protoplasm. Beale does not recognize any essential distinction between cell and intercellular substance, but only between bioplasm and formed matter. The cell may be, and is generally, made up partly of bioplasm and partly of formed matter, and we may have a tissue, such as epidermis, completely composed of such cells. But, again, we may have a tissue in which the cells are almost entirely composed of bioplasm, but these cells are separated by an intercellular substance composed of formed matter. Wherein, then, consists the difference of the formed matter in this case from that in the case of the epidermis? They both separate the masses of bioplasm, only that the one is within a cell and the other without it. We have said that Beale's bioplasm is equivalent to protoplasm, plus the nucleus. Dr Beale regards the nucleus in a somewhat different light from other authors. There is at present very considerable doubt as to the exact nature of the nucleus, and as to its function in the cell, though its almost universal presence in the cell is sufficient evidence that it has an important function. To Beale, however, the nucleus is simply a new centre of bioplasm, though for what purpose the new centre is required, or why there should be any centre at all, he does not tell us.

There seem to us to be several very strong objections to those peculiar views of Beale. As we have said, fundamentally, they amount to very much the same thing as the more current ones, and it is, therefore, to the strained peculiarity of them that objection may be taken. In the first place, it seems something very like a pure assumption to say, that all the so-called formed matter has been previously in the condition of bioplasm. The apparent reason in favour of this view is,

that at first in the embryo we have only masses of this bioplasm, and that, as the tissues are formed, the formed matter of various kinds is produced. But, as we have seen, this is susceptible of quite a different explanation. In what sense has the firm tissue of bone ever been in the state of bioplasm. That the cell has had to do with its formation, one can well believe, but it must be a very loose way of using the word, to say that the living, moving bioplasm by some means converts itself into the dense calcareous *tela ossea*. When the mollusc forms its calcareous shell, we do not imagine that a portion of its living substance is in some transcendental way converted into the calcareous formed matter, and in like manner, when the cell produces the various forms of intercellular substance, we do not need to seek for some peculiar conversion of its actual substance into this formed matter. No doubt the cell superintends the process, is the instrument by means of which the structure is elaborated; but this is something very different from saying that the actual substance of the cell is so converted. Another objection to Dr Beale's ideas, is, that he does not seem to lay sufficient strength on the individuality of the separate masses of bioplasm. Beale's bioplasm is, in fact, too much allied to Huxley's protoplasm, although the former would vehemently oppose such a conclusion. He does, indeed, acknowledge that there are multitudes of minute units which are continually at work, forming and regulating the body, but these units lose in great measure their individuality when they are talked of as masses of bioplasm. It is surely much safer, and much more scientific, to call all such independent units, cells, and this word has now become so generalised, that we can make such a use of it. The fact, further, that cells do appear in every tissue, that they can always be recognized by the microscope, as distinct from the intercellular substance where such exists, seems to indicate that they are of more special significance than Beale would acknowledge.

We conclude that the central doctrine of the cell-theory still remains unmoved. The body is still to be regarded as comparable to a free state, in which are myriads of working units, each of which lives a quasi-independent existence, supports itself, and, as a general rule, commands a certain amount of territory. This unit may still be called the cell, although the original idea of the word, that of a vesicle bounded by a membrane, and containing a nucleus and cell contents, is no longer applicable.

We have not attempted, in this article, to trace the process

by which the original idea of the *form* of the cell has been gradually modified, how the cell membrane has been shown to be non-essential, and now even the nucleus is absent in a few cases. Such an investigation would carry us beyond the limits of this review, and we have, therefore, contented ourselves with giving the fundamental principles involved.

II.—ON THE TREATMENT OF DISEASES OF THE SKIN; with an Analysis of Eleven Thousand Consecutive Cases. *By* Dr M'CALL ANDERSON, *Professor of Practice of Medicine in Anderson's University, &c., &c.* London: Macmillan & Co. 1872.

THIS book is a thoroughly practical one. It bears in every part the impress of that intimate acquaintance with the treatment of skin diseases which Dr Anderson possesses, and his aim seems to be to convey information in language as simple and direct as possible.

The volume is divided into two parts—the first devoted to the analysis of eleven thousand cases of skin disease, and the second to the therapeutics of diseases of the skin. Of the eleven thousand consecutive cases analysed in the first part, 10,000 occurred in hospital practice, and 1000 in private; and some interesting facts are noted as to the comparative frequency of the same affections in the different walks of life represented by hospital and private patients. After a tabular arrangement of these cases, the author takes up each disease separately, remarking on its peculiar features, and occasionally giving a hint or two as to treatment. In the second part of the work, that devoted to therapeutics, the various remedies used by the author are given, the principles on which a selection of each particular remedy is based are laid down, and the diseases to which each is appropriate are usually mentioned. The local treatment is first taken up, and to this four chapters are devoted, the concluding four chapters being engaged with the constitutional treatment. The value of the work in a practical point of view is still further enhanced by the addition of a copious index, by means of which the various modes of treatment of any particular disease can be at once turned up.

From these remarks it will appear that the work before us is not intended as a text-book of skin diseases for students, but rather as a *vade mecum* for the practitioner, to whom it cannot fail to be of the very greatest service. We would recommend all who are in the habit of meeting cases of skin

disease (and what practitioner is not?) to order the book forthwith. We may add that it is beautifully got up by the publishers, and its size befits the frequent and hurried reference made to such compendiums of therapeutics.

III.—A CLINICAL MANUAL OF THE DISEASES OF THE EAR. *By* LAURENCE TURNBULL, M.D., *Physician to the Department of Diseases of the Eye and Ear of Howard Hospital of Philadelphia, &c.* With a Coloured Lithographic Plate, and over 100 Illustrations on Wood. J. B. Lippincott & Co., Philadelphia. 1872.

It is difficult to speak of this volume in terms sufficiently just, and, at the same time, sufficiently searching. It is indeed a most portly volume, for, while any physician intimately acquainted with the diagnosis and treatment of diseases of the ear could tell all that it is important to know within the compass of a couple of hundred, our author treats us to close upon 500 pages of matter. We have not had the pleasure of perusing "the small work" published by him, and referred to in the preface, but we should not be the least surprised if it was a much more useful volume than the more ambitious one which lies before us.

Indeed, we can come to no other conclusion than that the object of the writer has been, not so much to give us the results of his own ripe experience, as those of other workers in the same field. There seems to have been no attempt to bring into small compass the views of others, and the length of the quotations is at times exceedingly distressing. Thus a quotation from Gruber's writings extends from p. 176 to p. 188, and another from p. 227 to p. 238; and many other instances of a similar nature might be given. At the same time, it must be confessed that the writer is evidently intimately acquainted with the current literature of his subject, and that he has the faculty, to an unusual degree, of sifting the wheat from the chaff. The illustrations, too, are very numerous, well selected, and, on the whole, faithfully executed.

In a work which, with the above exceptions, has been so well accomplished, it may appear invidious to select particular chapters for commendation, but we cannot help remarking that the one which treats of aural catarrh and its complications is of unusual excellence, and contains all that is known with regard to this, the most frequent, and often the most obstinate of all the affections of the ear. On the whole, we can heartily recommend this volume to the study of those who have already a fair

knowledge of aural diseases, and who have not the time or opportunity to study the works of the most recent authors; but it is not so likely to prove useful to beginners, being too lengthy, and entering too much into details.

Should another edition be called for (which is by no means improbable), we would strongly recommend our author to use the pruning knife with some freedom, to concentrate his material, and to compress and diminish the number of his quotations.

IV.—A STUDY OF SOME POINTS IN THE PATHOLOGY OF CEREBRAL HÆMORRHAGE. *By* CH. BOUCHARD, M.D., &c. Translated from the French, with notes, by T. J. MACLAGAN, M.D. MacLachlan & Stewart, Edinburgh. 1872.

THIS little work presents, in a very clear and convincing form, the results of a series of observations on the causes of cerebral hæmorrhage, especially in old people. The conclusion arrived at is, that, in the vast majority of cases of apparently simple hæmorrhage, the occurrence results from the rupture of *miliary aneurisms*, which have been found to exist in the cerebral substance of persons who have died from this form of disease. In the words of the author, "Aneurisms bear to the cerebral hæmorrhage of old people the same relation that atheroma does to senile softening."

In the introductory chapters it is acknowledged that "increased tension of the blood in the vessels of the brain" may, in exceptional cases, determine rupture of these vessels; but that "altered consistence of the cerebral tissue seems to be only an accessory, and even doubtful cause of hæmorrhage." On the other hand, it is pointed out that the fatty degeneration, and other changes so frequently found in the neighbourhood of hæmorrhagic cavities in the brain, are not, as many have supposed, the causes of the hæmorrhage, but secondary results of the damage done to the brain by the hæmorrhage. It is very common to ascribe cerebral hæmorrhage to atheroma of the arteries of the brain, but, from a comparison of various statistics, the author comes to quite a different conclusion, which may be stated in his own words.

"It appears that atheroma is more frequent in individuals who die of cerebral hæmorrhage, than in those who present no disease of the brain; but the difference is not very considerable, and the perfect integrity of the arterial system, observed in 18 per cent. of the cases of hæmorrhage occurring in old people, sufficiently proves that atheroma is not the essential cause of sanguineous apoplexy, and that it acts only as an aiding or pre-disposing cause."

The principal chapter in the volume is taken up with a description of a lesion which the author, along with M. Charcot, has found in all cases of simple cerebral hæmorrhage, and this lesion is the miliary aneurism mentioned above. These aneurisms are most easily discovered on the surface of the brain.

"On stripping the membranes off the brain of one of these patients, there is very frequently seen, either on the surface of the convolutions, or in the fissures between them, small spots scattered about in variable numbers, sometimes very numerous, and varying in colour from a bright red to a reddish or blackish brown."

These spots are the aneurisms which may be isolated from the nervous tissues by needles, but are continuous by one of their poles with a vessel which extends into the substance of the convolution. But though most easily detected on the surface of the convolutions, they are not most frequent there. "The parts of the brain on which I have observed these aneurisms are, in the order of decreasing frequency, the optic thalami, the pons varolii, the convolutions, the corpora striata, the cerebellum, the bulb, the middle cerebral peduncles, and the centrum ovale." The author associates the formation of these aneurisms with a process which will be found generally throughout the brain of patients so affected. This is a change in the small arteries to which the name *periarteritis* may be given, and which consists in a sclerosis of the walls of the arteries, with atrophy of the muscular coat. This change is essentially distinct from the deforming *endo-arteritis* and *atheroma*, which affect the internal coat, whereas this process involves almost alone the external coat. The sclerosis of the vessels allows of the aneurismal dilatations, and the rupture of these is the commonest cause of cerebral hæmorrhage. "All these aneurisms are visible to the naked eye; they look like little globular particles, varying in diameter from two-tenths of a millimetre to one millimetre, and even more, attached to a vessel which is likewise visible to the naked eye—a simple lens, at least, suffices to make them quite distinct."

And now aneurisms of this form are to be found in the walls of the cavities formed in hæmorrhage into the brain substance, and there they are often ruptured. The method used to find these aneurisms in the walls of the hæmorrhage cavities is worth noticing.

"After having freely opened the cavity, and allowed to escape so much of the clot as does so of its own accord, the brain should be placed in water, which should be frequently renewed, without shaking, simply by inclining

the vessel from time to time, so as to detach piecemeal the clot which is still adherent to the walls. After a time, which varies in different cases, there are isolated a considerable number of small bloody masses, which float on the surface of the cavity, but remain attached to it by vascular filaments. It is on these little masses that the microscope should be brought to bear."

It is proper to mention, in conclusion, that this work, which bears the name of M. Bouchard, is the result of the joint investigation of this author and M. Charcot. An appendix, containing a joint paper by these authors, is added to the present translation, and in it will be found a very concise statement of their results, as well as some more recent observations. The book, in its English dress, is very neatly got up, and the translation is very creditably done. We have noted a few typographical errors in the text; and especially in the foot notes do the German titles of books suffer pathological changes. Thus "Erweiterung" appears as "Ervesterung" (p. 36), and "Gefässe" as "Gefæsse" (p. 36), "Gefoesse" (p. 39), "Gefasserkrankungen" (p. 30), and "Hirngefæsse" (p. 32).

We must express our thanks to Dr MacLagan for presenting the profession in England with such a valuable addition to the obscure pathology of cerebral disease. The work is illustrated by four well-executed plates.

V.—ÉLÉMENTS DE PATHOLOGIE CHIRURGICALE. Par A. NÉLATON, *Membre de l'Institut, Professeur de Clinique Chirurgicale à la faculté de Médecine de Paris, Membre de l'Académie Impériale de Médecine, Chirurgien de l'Empereur.* Paris, Germer Baillière.

(First Notice.)

THE revision and publication of this work were undertaken by M. Jamain, Chirurgien des Hôpitaux, who had only finished the first volume when he died. M. Nélaton then appointed M. Péan, Chirurgien des Hôpitaux, and one of his most distinguished pupils, to continue the revision. The first volume was published in 1868.

In the *Prolégomènes*, we find, under "General Considerations on Operations," that it is strongly advised, that capital operations, or operations involving a considerable breach of continuity, should be performed in summer, in preference to any other season, when they admit of delay; as it has been observed that wounds heal much more rapidly during warm than cold weather, and that, in warm climates, capital operations are followed by much greater success than in cold. The great successes of Larrey, during the Egyptian

campaign, where the wounded were exposed to a temperature which rose at mid-day to 30 degrees Reaumur (F. 99 $\frac{2}{5}$), are taken as illustrations of this view, which is borne out by the statistical researches of Malgaigne, who ascertained that the two extreme seasons, summer and winter, were more favourable for the healing of wounds than spring and autumn. In winter, though the external atmosphere is cold, the wards and sick-rooms are guarded against this by being supplied with artificial heat; whereas, spring and autumn are transition periods, the weather is subject to fluctuations, and people thereby are apt to be deceived; so that, after all, it is the high temperature that is so favourable to their healing.

This important point may be explained, physiologically, by briefly examining the action of heat and cold on the human body.

A slight amount of cold, briefly applied, produces a tonic effect upon the body; but kept up continuously for a length of time, with the body at rest, it becomes a depressant. It tends powerfully to drive the blood from the surface, and so the nervous power of the superficial parts is impaired. It has also a tendency to shrink, or shrivel, the tissues (*cutis anserina*), among which the capillaries are most sensitive, quickly contracting, until their calibre no longer admits of the passage of blood corpuscles. Nervous exhaustion renders the body much more susceptible to the detrimental influence of cold. On the other hand, a certain amount of heat is necessary for the maintenance of life, and the lower the nervous power, the greater is the amount of heat required. This may be demonstrated roughly, by glancing over the scale of animated nature, from the most highly organised beings, on whom the cycle of the seasons has but little influence, down to the myriads of animalcules, which only live under the genial influence of the summer sun, and succumb to the first blast of cold wind. A certain amount of heat expands the tissues, increases the diameter of the peripheral capillaries, and facilitates the free flow of blood.

Patients, on whom capital operations (or operations involving a considerable breach of continuity) are performed, suffer from depression of the nervous system to a greater or less degree; and, besides, the constitutional effect, the tissues of which the flaps are formed, are injured, their nervous and blood supply is lessened. Both locally and generally, the condition is such as to render such patients

peculiarly exposed to the detrimental influence of cold; and most certainly to point to the employment of heat.

Putrescence is, no doubt, hastened by heat, but this merely supports the fact, that heat sustains the lower forms of life; and, with antiseptics, we no longer require to fear putrescence.

May it not, then, become a question, whether the wards, for the reception of patients who have been operated on, should be kept at a much higher temperature than they are at present; or whether M. Guyot's method of treating wounds by incubation, described subsequently, should be tried.

M. Nélaton enters at considerable length into the subject of local anæsthesia. He first alludes to M. Bousson, who found that the operations for fistula in ano may be performed painlessly, after the application of an ointment of belladonna to the part; and that, by applying a plaster of opium to the extremity of the finger, in a case of onychia, he was enabled to perform the partial tearing off of the nail without pain. Refrigerants are advised as local anæsthetics; but the old method of applying a mixture of ice and salt to the part, is stated to be the best method of producing cold, no mention being made of Richardson's spray apparatus, though it was in use for a considerable time prior to the publication of this volume (1868).

The use of carbonic acid as a local anæsthetic is referred to at some length, its history being traced, from its introduction as an anæsthetic by Thomas Percival, down to the researches of MM. Folin and Demarquay, who found that it had a decided anæsthetic effect upon cancrs at the neck of the uterus; upon other mucous surfaces its action was much lessened, and upon the skin it produced no effect.

M. Fordos tried to mix the carbonic acid with other gases or vapours, such as that of chloroform, and succeeded, in a case of cancrs of the uterus, in producing, in one minute, perfect immunity from acute pain, which lasted for thirty-six hours, by passing a current of carbonic acid gas through a sponge saturated with chloroform; and M. Verneuil, by injecting a portion of the same combination into the urethra, was enabled to practice catheterism on a patient who, prior to that, was prevented from allowing even the smallest sound to be passed into the bladder, owing to the violent pain produced by the attempt.

Hypnotisme is very fully treated, giving the experiments which were made by MM. Broca and Follin, à l'Hôpital Necker; those of Velpeau, on two patients à la Charité; the investiga-

tions of Trousseau, MM. Rechet et Denonvilliers, and those of Nélaton himself, à l'Hôpital des Cliniques. The result of these very interesting experiments, which we would advise all those who have a lingering belief in mesmerism to read, showed that it was in no way to be trusted as an anæsthetic agent.

Chloroform is the principal general anæsthetic used in France, and it is proposed to be given in many ways more or less complicated, M. Nélaton advising that, during its administration, attention should be paid to (1) the pulse, (2) the expression of the face, (3) the heavings of the chest.

We cannot in any way agree with these instructions, as they are all more or less fallacious. There can be no better instrument for the administration of chloroform than the towel, the admixture of air being regulated by the intelligence of the administrator. As to the points to be watched during its administration, when asphyxia threatens, the *pulse* is only affected after the patient ceases to breathe for some time, and is therefore of little value in detecting danger in time to do any good; the heavings of the chest are no criterion that air is passing into the lungs, as these heaving spasmodic efforts continue after the patient ceases to breathe; and the expression of the face is sometimes indicative enough, but at other times it is no guide. The point of paramount importance is to be convinced that air is passing into and from the lungs; and this may easily be ascertained, partly by the ear, and partly by the sensation of feeling. The currents of air caused by the inhalations and exhalations can always be distinctly ascertained by one or more fingers of the hand that supports the towel, kept close to the mouth, by the alternate heat of the exhalations and the cold of the inspirations. And, unless when the operation is on the head and face, the ear of the administrator may be sufficiently approximated to the mouth of the patient to *hear* the inspirations. If one feels satisfied on these points, he may rest assured that asphyxia cannot take place.

Our author thinks that death from chloroform may take place from uncontrollable circumstances; but, in the majority of cases, he considers that it must be ascribed to some inadvertence on the part of the administrator.

Among the rules to be followed during operation, marked attention is directed to the blood, often needlessly wasted. Nélaton thinks that surgeons cannot be too sufficiently impressed with that extreme debility which follows the loss of blood. We allow the author to speak:—

"I have several times seen patients who have undergone operations, die on the third or fourth day after the operation, from the blood which was lost during its performance, and during this time, several symptoms diagnostic of excessive hæmorrhage exhibited themselves: the surface of the body pale, moist and cold, the face and chest covered with perspiration, pulse small and extremely rapid, the thirst great; the muscular force so weakened that the patient does not make the least movement, and lies in a state of somnolence. Should the wound made at the operation be examined, one finds that it has undergone no organic change, and the surface is soft and pale; if flaps exist, they are cold, moist and flabby; or to give a more accurate idea of them, they look more disposed to putrify, than to become gangrenous. At the end of three or four days, death ensues, and at the post-mortem examination, the only thing peculiar, is the fluidity of the blood in the heart and great vessels."

A bloodless operation should be ranked next to a painless one.

With regard to the chapters devoted to the dressing of wounds, there is nothing which can benefit the reader. It is the old system which will soon be obsolete.

In his minor surgery the abstraction of blood is traced at length. Under the heading of *Saignée Capillaire*, an instrument invented by Junod, is used, as a large cupping glass; which may be applied to the whole extent of a limb at once, and its air exhausted by means of an air-pump—a manometre indicating the extent of the rarification. With this instrument powerful revulsive effects are produced; but M. Nélaton cautions his readers about producing rarifications too rapidly, or continuing it too long, as under these circumstances, syncope ensues.

In another chapter we find in M. Berard's experiments on bandages an example of how the French school examine, even simple things, with exactness and minuteness. A very useful remark is, that should bandages be used on any part for a considerable time, they should not be removed at once, as cedematous tumefaction comes on from sudden relief. A most interesting and lengthened chapter on the "General considerations of ambulances and field and naval hospitals" finishes the *Prolégomènes*.

In a long chapter on the general considerations of wounds, M. Nélaton enters very fully into the differences in the shape and size of wounds, according to the instrument which has inflicted them. M. Sanson has devoted a very great deal of time and labour to this subject, and finds that often the form of the wound presents no relation to that of the instrument which produced it. A few of the results of these investigations may be given, as they are of great interest in a medico-legal aspect.

1. When a sharp-pointed, double-edged instrument penetrates the integuments *perpendicular* to their surface, and when the integuments and tissues are equally stretched on all sides, then the wound represents the form of the instrument; the solution of continuity being, in general, less in breadth than the instrument, and less in depth than the length which the instrument has penetrated, the tissues being in part pressed aside.

2. When the same instrument enters *obliquely* into the tissues, or when the integuments are unequally stretched, the form of the wound does not indicate that of the instrument; for example, one of the sides will be pressed aside, and become concave, while the other remains straight.

3. If the instrument has only *one* sharp edge, the walls of the wound remain in their place toward the cutting edge; but are folded on themselves opposite the blunt edge, so as to render the wound triangular, and the tissues are pushed aside during the penetration, so that they afterwards present a wound, with dimensions much less than those of the cutting instrument.

4. When the instrument is only sharp pointed, without having any cutting edge, it is impossible (in the majority of cases) to recognise the kind of instrument from the wound which it has produced; this is so true, that the same instrument, when it inflicts several blows, often makes different forms of wounds in each.

In another chapter, Nèlaton points out that a great amount of pain which is felt during an operation, is dependent on the degree of attention which the patient centres on the part at the time, showing that wounds inflicted suddenly, or without the patient's full cognizance, are much less painful; and citing an example in support of this, given by Sanson et Bêgin, where "a young man, who placed his foot, without knowing it, in a furrow of melted iron, did not perceive that his foot was completely carried away, until he lost his equilibrium!"

The healing of wounds is dwelt on very fully; and, in his concluding remarks on that subject, the author states that there are certain conditions which favour the success of immediate reunion—viz., it is more easy among children, among men of a healthy constitution, and *during the heat of summer, or in warm climates.*

The method of incubation by M. Guyot is recommended, though M. Nèlaton will not pronounce any distinct verdict upon it until it has been more fully tested. In this method

the wounded part is surrounded by an apparatus which is kept at a temperature of 36° C., by means of an oil or spirit lamp. M. Guyot first made 54 experiments on rabbits, which gave such favourable results as to induce him to try it on man. He then treated by this method seven wounds from accidental causes, and 32 consecutive wounds and amputations, with very good results. It has been tried by several surgeons in the hospitals in Paris with favourable results.

On hæmorrhagic diathesis, the observations of M. Sanson are given, and numerous remarkable illustrations are quoted. M. Nèlaton states that he believes in certain constitutions being liable to hæmorrhage, but that he does not believe in its being hereditary.

In a long chapter on *Hémorrhagie Traumatique* we find a description of the method of ligature, but this is according to the old system. He directs that when the walls of an artery are encrusted with calcareous phosphates, bleeding should not be arrested by a ligature; but by placing a fragment of wax into it, either rolled into a cone or into a cylinder!

In a long article on tetanus, Nèlaton enters fully into the subject of its pathology; and while thinking that the symptoms manifested by this disease would lead one to suppose that the lesion must exist in the spinal cord, and that though this conjecture is supported by the similarity between it and the phenomena produced by strychnia (poison), and further by the convulsions observed in the first period of myelitis and of spinal meningitis, yet this supposition has no pathological facts to support it.

1. He shows that Dr Thompson, of Philadelphia, and Dr Goelis, of Vienna, have found the bulb of the spinal cord inflamed in children who have died from *trismus neonatorum*.

2. Professor Bréar has several times observed the spinal cord injected and hardened, and similar observations may be found in the journals. M. Monod communicated to the Anatomical Society a case of tetanus, in which he found, after death, that the spinal cord was diffuent from the fourth cervical vertebra down to the fifth dorsal. MM. Bouillaud, Gendrin, Possi, Clot, Combette, &c., have found inflammation of the cord, with softening either of its whole thickness or of the anterior pillars. Dupuytren found meningitis of the cord in a patient who died from tetanus following a puncture in the foot. In another case Tulli found a pseudo membranous exudation on the surface of the cord. Larrey found a reddish serosity in a case under his care.

So that if conclusions are to be drawn from these facts, it is necessary to admit that tetanus may be the result of—
 1. Myelitis, with induration, or the first degree. 2. Myelitis, with softening, or the second degree. 3. Spinal meningitis.

But Nèlaton does not admit these conclusions; for, while the presence of lesions representing “myelitis in the first period” are found, and alteration of the substance is often met with, yet in the great majority of autopsies the spinal cord is healthy. And he further states that “when induration and injection” are found, one is too hasty in believing in myelitis. “Few surgeons know the consistence of the spinal cord in its normal state, so that the induration which a few have characterised as belonging to this affection is only perhaps the normal state.” He ascribes the injection of the cord, in part at least, to the extreme difficulty with which the circulation has to contend in the last moments of life in tetanus, and to the embarrassment which is always produced in the circulation of the cord; so that it would rather be the effect than the cause of tetanus.

He admits that myelitis, as a theory of the cause of tetanus, is eminently physiological and rational; but he disregards it, as it is based on facts which are too complacently interpreted, and always insufficient. As to softening of the cord being a cause of tetanus, not only is it based on insufficient grounds, but even these, grounds as they are, are opposed to the most positive physiological facts, and contradictory to all that is known of softening, which generally leads to paralysis. With regard to meningitis, the fact reported by Tulli is unique.

The conclusion which he comes to is, that there is nothing pathologically to show that tetanus has its origin in the spinal cord or in its membranes.

With regard to the nerves, M. Jobert is said to have found, on the dead body of a woman who died à l'hôpital Saint-Antoine, an unusual redness and injection (which resisted washing) of all the nerves. M. Nèlaton thinks that this observation is unique; but Erichsen states a case in which he not only found the nerve reddened, but its sheath also injured and ecchymosed. So that the anatomical characters of tetanus are still unknown.

Under the *etiologie* of this disease, he states that *any* wound may cause it. It has followed the sting of a bee, the bite of a horse, the bite of a serpent, the blow of a whip. But bruised and lacerated wounds, especially if situated on the hands or feet, are apt to cause tetanus. Larrey had a

patient with tetanus, whom he believed to have taken tetanus from an incomplete division of the frontal nerve. On two patients, who died from tetanus at the *Hôtel Dieu*, as the results of blows with whips, Dupuytren found in one the knot of the whip enclosed in the ball of the eye; in the other the knot of the whip sunk into tissue of the ulnar nerve.

Nèlaton admits that sudden changes of temperature from heat to cold are apt to produce tetanus, and cites a number of instances. He also thinks that some sea coasts are liable to tetanus when the sea breeze blows towards the land, and gives as an illustration a fact related by Bajou, in his description of the Island of Cayenne, which is as follows:—There was a village, shut off from the sea by a high and dense forest, in which tetanus was unknown, though it was very common in other parts of the island. This forest was cut down, and tetanus became as frequent in this village as in any other part of that island!

When speaking of treatment, he states that, as the seat and cause of tetanus are unknown, the treatment has hitherto been in the dark, and still remains *assujetti au plus aveugle empirisme*. But he draws attention to two points:—1. That cold, playing on the surface of the body, checks the perspiration, and is thus apt to induce tetanus, as it has done in a great number of cases, at once. 2. *The copious perspirations* which sometimes accompany the recovery of that malady. And from these he infers that diaphoretics are indicated, stating that A. Paré succeeded in curing a soldier who had tetanus, following an amputation at the elbow, by placing him for three days in a stable, and enveloping him in a double layer of straw and dung, the face only being left free. François Fournir had seen a sailor who had tetanus, and who was placed in the hold of the ship for four hours, in an extremely hot atmosphere, which produced abundant perspiration, and he was cured. The same author states that he cured a patient by producing diaphoresis by giving him hot drinks. He further recommends the use of hot baths, and the apparatus of M. Duval, for the purpose of producing diaphoresis.

But his statement with regard to the tetanic patients *who recover* being bathed in profuse perspiration is fallacious, inasmuch as, it might lead one to infer that those patients who do not recover are not bathed with copious perspirations. Most tetanic patients are covered with profuse perspiration, from the mere force of the muscular effort. And if

we look at the fatal case of Hughes given in "Macleod's Surgery of the Crimean War," we find it stated, "His skin was always bathed in perspiration, having a most pungent and offensive smell." And in the fatal case of "Baker," from the same author, it is stated that "his skin was always covered with an odorous perspiration." And in several other cases, which we are cognizant of, the patient was covered with perspiration almost continuously.

Then follows lengthened descriptions of "how to keep the mouth open." In this case we think that it would be very much easier and safer to introduce a tube by the nose and so feed the patient instead of forcing the mouth open, which of itself would tend to prolong the disease.

It is stated that Lisfranc, in nineteen days, made nineteen bleedings, and applied 772 leeches in a case of tetanus, and that his patient recovered! and that Lepelletier bled five times, abstracting a kilogramme at each time, and his patient also recovered!

Among remedies proposed, we find various kinds of baths,—mercury to salivation, lavements of tobacco, chloroform and the curara used by M. Villa—but all of no use. Nélaton goes against amputating part. There is no mention of the physostigme, which we think holds out a lingering hope.

Lately, M. Oré (*Chirurgien de l'hôpital Saint André*) showed that chloral injected into the veins, produced immunity from tetanic spasms, induced by strychnine. And he argues, that therefore chloral may be of use in Tetanus! Now, though there is a great similarity in the phenomena manifested by both tetanic and strychnia poisons, yet there seems to be a wide difference in the cause. While in the latter case, we have a poison which may be eliminated in a few hours, the cause of the tetanus seems to remain for *at least* a much longer time.

VI.—A MANUAL OF CHEMICAL PHYSIOLOGY, INCLUDING ITS POINTS OF CONTACT WITH PATHOLOGY. By J. L. W. THUDICHUM, M.D. London: Longmans. 1872. 8vo. pp. 195.

To give an outline of physiological and pathological chemistry, in 59 widely printed pages, and a guide to the testing of animal substances in 131 pages, is what this book attempts. It, besides, professes to be complete, and to contain the latest acquisitions. If it be remembered, however, that the known facts connected with some branches of the subject occupy more space than this

book altogether, and that to state even concisely the differences of opinion (and arguments in support of these) on certain unsettled but most important points, would fill even more space, it will be understood that it is impossible that this book can be complete, in the ordinary acceptance of the term, even as an epitome.

The first part contains a sketch of animal chemistry, or, rather, a series of notes, such as a lecturer might employ to assist his memory, and to keep him from wandering; or it might be the abstract of a student who was reading a larger treatise, such as Kühne's, and who wished to have aphoristically the main ideas.

As in the larger work just referred to, which seems to be the model the author has copied, this outline follows the physiological rather than the chemical order. In other works the proximate principles are described and classified chemically, then the complex mixtures in which they occur, and, lastly, the chemical functions performed by the organism. In this, the natural order is taken, and the subject begins with digestion in the widest sense, and round that function the chemistry of the organism is built up. Thus, saliva forms the starting point. The question of starch digestion, of glycogen, and of diabetes, is here introduced, and then comes digestion in the stomach and duodenum. Bile follows, and as this is one of the subjects on which the author has spent considerable labour, it has received a proportionally large space. The most important division is on the blood. Mention, of course, is made of its spectroscopic appearances; the changes in it produced by cholera and by various poisons are referred to, and several other particulars, such as coagulation, are enumerated. The next subject is the solid part of the animal structure, the muscles, brain, nerves, fatty tissue, cartilage, then the bones, with their commonest morbid affections. This is followed by the chemistry of the glands, and the first division concludes with five pages devoted to the respiration, urine, and other excretions. Under the urine there is again a large proportional space devoted to the author's own discoveries. This, however, is rather an advantage, since they have not yet had time to appear in other works.

The second division of the book contains, in alphabetical order, the animal substances, with some of their reactions, and it is meant mainly for laboratory use. It gives, of course, only qualitative methods, except in one or two instances; and even the description of these is made as bare as possible. The list of substances is not complete, and the space has not been always fairly divided among those included. The section upon albu-

men, compared with that upon luteine, will illustrate what we mean. We should think that any student who intended to undertake the experimental study of animal chemistry would find it advantageous to begin at once with fuller details.

The drawback under which the book as a whole labours, is the narrow space to which the author has confined himself. There is a limit even to placing limits; and, in a subject like animal chemistry, where so much full description is required, it is useless to attempt the mere enumeration of facts. Take, for instance, what it is thought worth while to say (p. 55) about urea in the urine. Even supposing that its formula, the quantity of it secreted per diem, and its being the most abundant ingredient in the urine, are interesting facts, there is surely something further to be said about it, even in an epitome of chemical physiology.

As for the amount of pathological chemistry, it is not so full as the contents or index of a treatise on the subject ought to be. The mere mention of morbid products, or of the abnormal occurrence of ordinary substances in certain morbid conditions, is, for the physician or zoo-chemist, only preferable to having them omitted altogether.

So far as it goes the information in general seems to be accurate, but the formulæ of calcic and magnesian phosphate (p. 47) have been misprinted. There are, however, peculiarities of expression which it may not be out of place to notice. Hydrothion and rhodanic acid (strictly it should be hydrosulphuric acid) are adaptations from the German, which are unnecessary in so far as they are not more accurate than the common English names, sulphuretted hydrogen and sulphocyanic acid; "iodide" for "potassic iodide" (p. 7) is an unscientific form of nomenclature; "polydynamic" (a better word etymologically) is used where others employ polyvalent, but the drawback is that it suggests a hypothesis which the common word does not. There are one or two places also, as on p. 24, and again p. 38, where the words do not convey precisely any meaning. The emendation of these and of some other defects would make the perusal of the book more agreeable; to make it useful it would be necessary to make it a good deal fuller.

VII.—OBSERVATIONS ON MYOLOGY. By G. M. HUMPHREY, M.D., *Professor of Anatomy in the University of Cambridge.* Macmillan & Co. 1872.

DR HUMPHREY has, in this volume, brought together a number of papers published in the *Journal of Anatomy and Physiology*, and has added notes on the muscles of *Uromastix spinipes*.

Considering that muscular anatomy now commands a special literature of a very scattered kind, no better service could have been rendered to anatomists than by presenting them with a series of detailed observations, accompanied by the generalisations which they suggest.

It would have been a profitable occupation to have compared the views enunciated by Humphrey in the chapter on the Disposition of Muscles in Vertebrate Animals with those of Gegenbaur and Huxley, especially with reference to the homology of the thoraco-humeral with the pubischio-femoral flexors. The comparison of the *Latissimus dorsi* with the *glutæus maximus* as its equivalent presents some points of interest, since the identification of corresponding muscles in inferior vertebrates involves the assumption that somewhat wide variations in the relations of muscles to the axial skeleton does not affect their homological value. Adaptive modifications undoubtedly are efficient in producing some deviation, as Dr Humphrey rightly points out is the case as regards certain scapulo-humeral muscles which are attached not to particular intrinsic regions of the bone, but to that portion which presents itself in a particular fashion. Thus in the dog-fish and *ceratodus* (p. 162) the scapulo-humeral muscles are inserted in the dorsal face of the limb; in higher vertebrates the radial margin of the limb presents itself, and hence identification has been confused from a too exclusively anatomical way of looking at the question. But the comparison above alluded to is somewhat different. The same embryonic parts may give rise to now one, now another series in an affined group of muscles; may not a function be discharged by a muscle not homologous in the proper sense, not even belonging perhaps to the same system? Just as in *Pholas dactylus*, the muscle which in other bi-valve molluscs closes the shell sends some fibres to the outer surface of the hinge area, and thus helps to open the shell.

The pathology of certain spasmodic diseases is illustrated by the reference of muscles to certain great systems. Thus the varying condition of the facial muscles in tetanus has reference to the opisthotonic or emprosthotonic character of the seizure, the temporal and the mandibular elevators belonging to the great dorsal mass, and supplied by the 5th pair, those which depress the mandibular to the ventral series, and supplied from the 7th pair. Though, of course, in the vertebrates the relation of the nerve centres to distant parts of the trunk is not very remote, and thus supplies an explanation of the general involvement of the body in any morbid state, the influence of muscular

continuity and of genetic relationship is seen in invertebrated animals, where the energy of movement is in proportion to the vicinity of a muscle to the injured part. We hope on a future occasion to recur to this subject, for we think that certain common principles in surgery have their unconscious basis in comparative anatomy, though the so-called "practical man" may despise the notion, probably will, being ignorant. Meanwhile, we would commend our anatomical students to take this volume as a model in research, and, if it were competent to make suggestions to Examining Boards, we would humbly ask if the mastery of the muscles of an animal, or its vessels, or its nerves, with as much mechanical detail as in this volume, would not give better proof of sound mental discipline and professional capacity than do some of the subjects in the preliminary examinations?

VIII.—CONSUMPTION, AND THE AIR RE-BREATHED, A WORD WITH REVIEWERS.

By HENRY MACCORMAC, M.D. pp. 16. London: Longmans, Green & Co. 1872.

THE *Medico-Chirurgical Review*, *Nature*, and the *Glasgow Medical Journal* are not prepared to accept from Dr MacCormac "the momentous fact that the respiration of already breathed air is the one invariable source of tubercle," and hence this "word with" those "Reviewers." We are not going to exchange words with him. A very small object can be made to obscure the sun, and scientific truth is hidden from Dr MacCormac's sight, by himself and his one idea. "I shall not, indeed, rest satisfied, so far at least as depends on me, until medical men and the general public, guided by them, shall everywhere practically endorse my theory as to the exclusive causation of tubercular disease, &c., &c."—the reader can supply the rest. Most men of science are well pleased if, in the course of a lifetime, they can discover a fragment of the truth concerning any great problem of nature. Dr MacCormac has found his fragment, but his self-satisfaction is so great that he sets it up and worships it, summoning all the more modest discoverers of other fragments to his little shrine. It was a fatal moment for Dr MacCormac when he fell upon the idea of the "air rebreathed." He has done nothing but burn incense to it ever since, surrounded by the adoring letters of the alphabet, "Dr F., Cannes; Dr T., Liverpool; Dr R., Cheltenham; General Stabsart, S., Hanover; Dr S., London." (Foot-notes, p. 10.)

Dr MacCormac's taste shews itself to be as depraved in the praise which it approves as refined in the censure which it rejects. In an Appendix to the present pamphlet we are treated to a sample of "perhaps a hundred letters, unsolicited and spontaneous expressions of adhesion to my doctrines as respects the origin of Consumption." One of those from "non-medical people" Dr MacCormac "preserved." The innocent amusement thereby afforded us makes us forgive and forget all his hard words. Notwithstanding its length, we cannot deprive our readers of one word of this inimitable letter from another alphabetic friend—"E., A.M., M.D.:"—

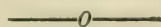
"Oxon, 22nd September, 1866.

"DEAR SIR,—I have this moment finished reading your Work on Consumption. Depend upon it, you have solved the origin of Consumption, scrofula, and the whole train of diseases having this one common cause, though called by so many other names. You have sung throughout the work the Hallelujah chorus of death in prebreathed air, such, that mankind will be compelled not only to hear, but to heed, and obey. It is felt to be a great discovery, and the opposition of Dr—— and company is, in fact, your greatest compliment. Their behaviour was perfect snobbery, wounded pride—a simple discovery of truth, and not one of them had the brains to bring it to light. When you are gone, these views will be brought out, either as *their own*, or you will have the honour as Jenner and Harvey had. So do not bother yourself, 'Await the great teacher Death, and God adore.' For you have left 'footprints on the sands of time,' which no wave roll of oceanic opposition can obliterate. These footprints will last, because every moment is rendering them adamant, and ages yet unborn shall find them, and exclaim, Are these MacCormac's footprints? Did he stand on this very spot? Is this the material embodiment of his great prebreathed law? Yes, when your spirit has passed off, and is advancing towards higher forms of knowledge, and exploring profounder depths of wisdom in the great arcana of Spirit creation, your spirit will have the happiness, the consolation, that, while it occupied a material body on this earth, it discovered a law whereby life was both preserved and lengthened, and untold millions were saved from an early death in consequence thereof. You can afford to wait. The discovery is yours. No one can take it from you. The *Press* settles that point. The principle may not take root in your life time, but that it will live and be acted upon, is as certain as that Newton availed himself of the laws of Kepler to demonstrate a philosophy co-extensive with the durability of the heavens themselves. Believe me, Dear Sir, faithfully,

"E. A.M. M.D."

We have written to Mark Twain, asking him if "The Innocents" were really "Abroad" on the 22nd September, 1866. The nature of the reply will put at rest certain doubts which haunt us as to the authorship of this letter. Dr MacCormac has no doubts whatever, and we must, as reviewers, abandon for ever the hope of pleasing a man who will swallow complacently nothing less highly flavoured than this.

Clinical Record.



I.—COMPOUND FRACTURES TREATED IN THE GLASGOW ROYAL INFIRMARY.

Under the Care of DR GEORGE BUCHANAN.

Reported by JAMES W. ANDERSON, M.B., *House Surgeon.*

THE following is a short account of the compound fractures, nine in number, which have been admitted to Dr Buchanan's wards from the beginning of the summer session to 16th Sept., 1872. The treatment has been almost the same in every case, and the result uniformly good:—

1. A. M'P., aged 53, admitted 20th May, 1872, with a compound transverse fracture of tibia and fibula. Wound about two inches long and one broad, freely exposing the bone; caused by some stones from a wall falling upon him. As injury had been sustained only half an hour before admission, wound was injected with a weak watery solution of carbolic acid (1-40), the protective oiled silk placed over it, and eight layers of the carbolized gauze, with a fold of jaconet coated with india-rubber, applied. The limb was then placed in a box-splint, well padded with oakum, and fixed with a bandage.

May 22nd.—On removing dressings this morning for the first time, the wound was found covered with a clot fully the size of a five shilling piece, and about half an inch thick; only a slight sanguineous discharge on the gauze. Clot not touched, and limb dressed as before.

24th.—Clot entirely disappeared, leaving only a thin film between edges of wounds. There was a mere staining of the gauze, and Dr Buchanan pointed out to his ward class that at least the greater part of the clot must have been absorbed—a sure indication that case was antiseptic. After this, limb was dressed twice, and latterly once a-week. Patient never had the slightest constitutional disturbance of any kind: pulse, for first forty-eight hours, about 80; after that, normal. He was not dismissed, however, till the 19th August, six weeks after fracture had become simple, on account of delayed union.

2. J. M'C., aged 54, admitted 25th May, 1872, was carrying a bar of pig-iron, weighing about 3 cwt., when it fell on his leg. Tibia is exposed for fully four inches, and is fractured somewhat obliquely a little above ankle and at lower edge of wound. Limb dressed as in previous case, except that wound was injected with a stronger solution of carbolic acid. It was dressed every third or fourth day at first, then every fifth, and by 20th June wound was perfectly superficial. Dismissed well on July 30th. As in previous case, there was never more than a drachm or two of sero-sanguineous

discharge on each dressing, and never the slightest constitutional disturbance.

3. J. L., aged 39, engineman, admitted 30th May, 1872, with a compound comminuted oblique fracture of tibia and fibula, caused by piston of engine striking the limb. Wound about size of half a crown, and through it two or three little pieces of bone were removed. Examined by Dr Buchanan next morning, who found the fracture much more severe than was at first supposed. Enlarged the original wound, and removed several pieces of bone; made another incision on inside of limb, and sawed an inch off upper fragment of tibia, which was considerably displaced. So serious was the fracture that amputation was spoken of. Antiseptic dressing continued as in former cases. On the following night patient was rather restless, and there was a considerable purulent discharge next day. To favour union, limb was to be dressed as seldom as possible. On removing the dressings at the end of three days a slight but undoubted odour of decomposition was felt on gauze. Pulse now 96. A solution of carbolic acid and spirit (1-10) carefully injected into wounds. Dressed again on 6th and 8th June, and on the 10th there is the following note:—"Wounds have been frequently injected with various strengths of carbolic acid; still dressed under spray, and with the gauze; no smell of decomposition perceptible to-day on dressings; pulse now from 76 to 80; appetite has been unimpaired from the first." After this the only cause for anxiety was the extreme mobility of limb. When the case was left untouched, say for a week, to favour union, a slight smell could be felt on the dressings, but not sufficient to be felt by any one near the bed. Patient is still in hospital, as union is not quite perfect, but fracture is long since simple.

4. J. G., aged 24, breaksman, admitted 14th June, 1872, in the evening, with a compound fracture of femur. There are two wounds, each about the size of a florin—one on upper, the other on lower surface of thigh, opposite to, and communicating with fracture. There is considerable bruising and separation of the muscles, and limb very much swollen. Put up antiseptically, wound having been first very carefully injected with a spirituous solution of carbolic acid (1-10), but splint not applied on account of the swelling.

June 15th.—"In Dr Buchanan's absence, case seen this morning by Dr Alex. Paterson, who took charge of it throughout. Dressed anew, and put up in long splint." From the first, case was dressed twice a week; continued perfectly antiseptic, and, on the 17th July, union had taken place, and wounds were superficial. After this, dressed once a week. Dismissed 28th August, well.

5. H. S., aged 30, admitted 4th July. Compound fracture of arm and both bones of fore-arm. Was struck on arm by buffer of railway engine with such force as to knock him down. Wound over each fracture; small, only admitting little finger. Limb swollen, but little or no bruising of tissues. Dressed antiseptically, and put up in poroplastic splints from

shoulder to wrist. The injuries to the soft parts being comparatively trifling, wounds were closed in a fortnight, without a drop of pus. He was allowed to remain in hospital till 11th Sept.

6. J. B., aged 28, admitted 9th July, 1872. Run over by a 'bus, causing a compound fracture of tibia and fibula, close to ankle joint. There are two wounds—one just above internal malleolus, size of half-a-crown, the other opposite, on outer side, size of a shilling. The fractures are easily felt by the finger to be somewhat irregular; one small piece of bone removed. Dressed antiseptically, and put up in short side splints.

July 26th.—"Has been dressed every day for a week, as there is a tendency to displacement of foot. Perfectly antiseptic. Patient complains of nothing. To be dressed every second day."

Aug. 23rd.—"Has not been dressed for a week, and fracture is now found to be simple." Patient is still in the ward, but is now able to go.

7. S. K., aged 53, admitted 19th July, 1872, with a compound fracture of tibia, from a fall over a one-storey window. Fracture is very oblique, and upper fragment protrudes for an inch through wound, and cannot be kept perfectly in position. Dressed antiseptically, and put up in box-splint. Dressings were changed every second day for about a fortnight; discharge very little, and perfectly odourless.

August 2nd.—"About an inch of tibia removed by Dr Buchanan this morning." After this, case was dressed twice a week, a small piece of tibia being visible at orifice of wound.

From the 25th August, was dressed once a-week, and wound soon granulated completely over bone. Patient is now fit to be dismissed.

8. D. R., aged 16, admitted 23rd August, 1872, with a compound transverse fracture of tibia and fibula. Was run over by a van. Wound just over the fracture, fully the size of a five-shilling piece, exposing tibia. Put up antiseptically, and in box-splint. On removing the dressings two days afterwards, they were found almost saturated with a thin sanguineous discharge, but quite odourless. On 2nd September, it is noted that "discharge is now purulent, with a questionable odour of decomposition, and amounting to about an ounce on each dressing, which is changed every second day. No constitutional disturbance."

Case at present is dressed twice a week; pulse normal, appetite impaired, but a slight smell can be felt from dressing when held close to the nose.

9. J. W., aged 13, admitted 2nd September, 1872. A heavy plank of wood fell on leg, fracturing both tibia and fibula, the former obliquely, with a tendency to displacement. Wound immediately over fracture, running transversely, about an inch and a half long, and half an inch broad. Dressed antiseptically, and put up in lateral splints. Dressed on the 4th inst., and since then, every third or fourth day. There is only a slight serous discharge on each dressing, perfectly odourless. After the first forty-eight hours, pulse normal, and appetite unimpaired.

Of the nine cases, then, the third and eighth were not perfectly anti-septic; in the former, the pulse alone indicated constitutional disturbance, keeping for a few days at 96; in the latter, decomposition has not been sufficiently established to affect either pulse or appetite. During the changing of the dressings, the carbolic acid spray (1-40 watery solution) has been invariably used. All the fractures of the leg have been put up either in short lateral splints, or in a box splint.

II.—INTERESTING CASES FROM DR GAIRDNER'S CLINIQUE, WITH REMARKS.

Reported by SAMSON GEMMELL, M.B.

1.—*Tubercular Pericarditis, with 21 oz. of fluid effusion—Absence of friction murmur, notwithstanding masses of shaggy lymph—Vaulting of precordial region—Secondary left pleural effusion—Pulse at wrist almost suppressed—No orthopnoea until after increase of pleural effusion—Anasarca—Ineffectual attempt at relief by paracentesis pericardii—Causes of failure—Remarks.*

J. H—, aet. 27, admitted Sept. 30, 1872, sailor, native of Finland. As the patient was wholly ignorant of English, the following history was obtained through M. Tabell, who acted as interpreter, but for some days after admission no verbal information was attainable:—

History.—He had been seized five weeks before, on the passage from Alexandria, and attributed his illness to sleeping on the deck when a heavy dew was falling. He was first attacked with pain in the throat, and then in the chest, accompanied by headache. On arriving at Gibraltar, he went ashore and had twelve leeches applied to each side of his chest. This was a week from the onset. The treatment relieved the pain in the chest and head, and he considered himself almost well, when he noticed slight swelling in the feet. The swelling extended up to the groin, and was, according to patient's statement, pretty considerable. This was his state on arrival at Falmouth, a week prior to admission into the hospital. During the interval of this week the swelling began to subside, and the chest symptoms reappeared. He says he "felt very bad in his heart and across the stomach," the pain commencing in the region of the stomach. He had considerable palpitation, and could hardly breathe at all. He could not lie on his back on account of the difficulty of respiration, but he could on his right side, though not on his left, on account of the pain. This pain did not extend to his back. The cough began at Gibraltar, but has never been of any consequence, and the spit has been *nil*. He never at any period of his life had rheumatic fever, or pains in his joints, or scurvy.

Condition on Admission.—He complains of weakness generally, with an uneasy feeling of distension in the epigastric region, but says he has no pain,

Looks languid, pallid and puffy about the eyelids. The respiration is tranquil, skin hot and feverish, but dry. The pulse almost gone in the radials. The stethoscope gives the cardiac contractions as 100 per minute, and they are regular. Tongue white and dry. Slight œdema of the feet and ankles. No œdema elsewhere.

Physical Exam.—The chest is well formed and well nourished, but the movement of the two sides is different—that of the left side being decidedly restricted; and the left front yields dull percussion from about the second rib downwards. Auscultation and percussion of the right lung are good throughout. Over the upper part of the left lung the respiration is markedly puerile in quality, but without râles, except at a point a little above the nipple, where a râle is heard of a somewhat crepitant quality. The cardiac dull percussion extends a little beyond the vertical line of the nipple on the left side, and on the right side it crosses the mesial line for at least two inches. No apex-beat can be detected, but when laid on his side, a faint thrill is appreciable. The heart's sounds are very faint, especially at the apex, but they appear free from murmur. The urine deposits urates, but otherwise it is normal.

October 4th.—Watching for the last four days with great care, leaves it almost impossible to determine whether the morbid phenomena in this case are progressive or not. It does not appear to Dr G. that the urgency of the symptoms has been such as at any time to demand extreme or surgical procedure. In fact, there has been no orthopnœa, lividity, nor extreme pallor, nor struggling nor gasping, and no very considerable cough throughout. On the other hand, there has been a slight tickling, dry cough, and obviously a sense of thoracic uneasiness referred to the left side. The pulse has been extremely small, at times almost suppressed, and, for the last two days, cannot be counted at the wrists with confidence, although, upon auscultating simultaneously, the heart's action is discovered to be quite regular, and a wrist pulse can just be made out corresponding with each cardiac impulse, the rate of the heart's action being 112 per minute. The sounds, as heard over the precordial region generally, and over the apex region in particular, are feeble and distant, the second preserving the natural quality better than the first. There is no murmur with either sound. The dulness on percussion seems to have somewhat increased, but this is not certainly from extension of precordial dulness. Two days ago, the latter was marked as probably at least $6\frac{1}{2}$ inches broad, being, however, rather ill-defined towards the left; and it seems certain that on the left lateral region, as also on the lower part of the back, there is moderate, but not accurately-defined pleural dulness. To the right, the apparent precordial dulness extends $2\frac{3}{4}$ inches to the right of mesial line. Its upper limit is about the second rib, but may possibly be made to reach the first intercostal space at one point. The lower margin of the hepatic dulness is from $2\frac{3}{4}$ to 3 inches below xyphoid cartilage, while, at the same time, the edge is scarcely, if at all, depressed in the

lateral region, and there is a very distinct appearance of tension in the epigastrium. The markings of the intercostal spaces are obliterated on the left side all over the precordial region, and diminished in distinctness down to the seventh space; much more so at the anterior part than in the lateral region. The respiratory movement is distinctly greater on the right side. —*R. Potass. Iodid. gr. v. ter die.*

Oct. 5th, 1872.—It is still very difficult to arrive at a conclusion as to whether there is improvement or not in this man's condition. The limits of dulness seem rather extended to the left, but not to the right; in fact, the extension is chiefly in that portion of the dulness which is regarded as pleural. The pulse is very much the same as yesterday. At the usual site of the apex-beat, the first sound is almost inaudible, and the second extremely faint. At the sternum the sounds are more distinct, but still very feeble. Even at the base, the first sound is entirely wanting in distinctness and tone. No murmur anywhere. There is not much increase in the dulness behind on the left side, but perhaps there is also a little on the right, and respiratory murmur is rather feeble at both bases, with traces of mucous or sub-crepitant râle.

October 7th.—Last night, at 12 o'clock, patient had an attack of breathlessness, respirations being 45 per minute, with pain in the chest, which appeared to Dr Gemmell to threaten life. It passed off, however, with the use of brandy as a stimulant. This morning, patient both appears to be and expresses himself as worse than yesterday, but there is no trace of the agitation of the night unless it be in a slight dilatation of the nostrils. Respirations about 24 per minute, without wheezing, but there is slight though frequent cough with an indistinct sound of mucus in the throat, nothing being expectorated. It is not considered expedient to re-examine the back, but the limits of dull percussion in front seem to be slightly extended towards the right, perhaps 3-8ths of an inch, and also if anything, upwards, not so perceptibly to the left. The margin of the liver is decidedly lower in the epigastric region, nearly four inches below the end of xyphoid, and the depression is still confined to the left lobe. No friction sound, and the cardiac sounds very faint—the first being almost, if not entirely, suppressed over the greater part of the precordial region.

The patient, considering the grave danger, has been throughout very tranquil, and has not at any time had orthopnoea or violent struggle of any kind. His colour, however, is more pallid and earthy to-day than it has been yet, with barely a trace of lividity. Urine deposits pink lithates, and is entirely non-albuminous.

7th Oct., vesper.—Patient has continued much in the same state as above described by Dr Gairdner. At 9½ P.M., Dr G. introduced a trocar and canula through the chest wall in the 6th intercostal space, half an inch inside the vertical line of the nipple. The canula was introduced almost to the hilt, but no escape of fluid in any quantity took place, only a few drops of serum tinged with blood coming away. Several attempts were made to

withdraw the fluid by an exhausting syringe, but were quite fruitless. Shifting the point of the canula about did not lead to any better result, and it being deemed expedient not to persist in the attempt, the canula was withdrawn, and plaster applied on the wound. The introduction of the trocar seemed to cause very acute pain, and he struggled slightly. Dr Gairdner cannot be quite certain that the canula was in the pericardium. Ordered brandy, 4 oz.

Dr G.'s note of next morning.—On the first introduction of the canula nothing came away at all, not even the smallest trace of blood, and, after clearing it as carefully as possible, it was then pushed a little further in, and it was at this stage apparently that the most acute attack of pain was suffered. Even then there was no exit of fluid, but after a little while, without any further movement of the instrument, a yellowish fluid, very faintly tinged with blood, welled away in individual drops. It was then thought that possibly the exhausting syringe might overcome the obstruction, and it was applied without any result, the utmost force that it was deemed expedient to employ apparently leading only to the creation of a vacuum, without, however, any manifestation of suffering on the part of the patient. After this, fluid in drops continued to well away as long as the canula was left open, but after fully half an hour had been spent in attempts to change the position of the instrument, so as to get at a larger amount of fluid, the effort was abandoned as above-mentioned. Dr Scott Orr and Dr Hector Cameron were present, and both of them, along with Dr G., using the canula as a probe, attempted to ascertain whether the end of it was in a free cavity, but without a perfectly certain result, as at times it seemed to move freely, at other times to be controlled. Upon auscultation around the point of puncture, the canula being inserted as above-mentioned nearly to the hilt, a friction sound was distinctly audible, not with the cardiac movements, but with the respiration. There was no jogging movement experienced with the cardiac beats, nor did the drops of fluid appear in the slightest degree to be regulated by the cardiac action.

Oct. 8th, morning.—Patient was easy during the early part of the night, but feverish, and about five A.M., an attack of orthopnoea supervened, with wheezing respiration about 50 per minute. This attack continued for about an hour. At present he is not in a very obviously different state from yesterday, except that he still sits up and complains of pain about the left side. Bowels are also more loose than they have been since admission.

On physical examination, the right and upper edges of precordial dulness do not seem to be altered, but more dulness in the direction of the left axilla, and also in left back. There is also more mucous r  le at the right base than formerly. No change as regards the cardiac sounds. Pulse at wrist exceedingly feeble.

He does not complain of cold, nor, indeed, of anything special, and says, on being specially asked if he wants anything, that he wishes to

sleep. The tranquillity of his appearance is maintained, as formerly. There is no expression of great anxiety, and no gasping.

The temperatures, since admission, have ranged from 99·4 to 102·6. The morning temperatures averaging 100·5; the evening, 101·3. There has been a relative rise during the last two days, and the temperature of this morning is the highest of the morning temperatures—viz., 102·4.

Oct. 8th, evening.—Died at 9 P.M., having grown gradually weaker during the day. The swelling in the feet had slightly increased, and of this the patient was himself conscious. The orthopnoea continued, and he had two or three fits of gasping, and complained of great pain in the epigastrium, which was relieved by fomentations. The physical signs pointed to more effusion into the left pleura—the dull percussion reaching high into the axilla. His state would not admit of a minute physical examination, but the cardiac phenomena appeared to continue much the same. He died somewhat suddenly, but without the slightest struggle.

Post-mortem made by Dr Coats, Oct. 10, 1872.

Very well developed body.

The pericardium contains $\frac{3}{4}$ xxi of a reddish somewhat turbid fluid. On the pericardium on the outside there is discovered an ecchymosed spot about the size of a halfpenny, corresponding with the situation of the puncture made during life, and in the midst of this an aperture is found through which a probe can be passed into the cavity of the pericardium. The parietal layer of the pericardium is very much thickened, the thickening being caused by the deposition on the internal surface of a layer of pretty firm lymph, which shows traces of vascularisation. The entire thickness of the pericardium is about $\frac{3}{16}$ of an inch. The visceral layer is excessively thickly coated with soft lymph, mingled towards the apex with extravasated blood. The surface of the lymph is extremely irregular—masses of lymph hanging in festoons. The heart itself is normal in size. On more careful examination of the blood extravasated near the apex, it is found that the seat of the blood-stain is opposite the external puncture, and therefore presumably connected with it; the coloration is quite superficial, only penetrating about $\frac{1}{8}$ of an inch into the lymph.

The left pleural cavity contains $\frac{3}{4}$ lvi of a brownish tinted fluid. The surface of the pleura is coated to a limited extent with soft lymph generally diffused, but most abundant at the lower and anterior portions. The right pleura contains $\frac{3}{4}$ xi of slightly tinted serum. Except collapse of left lung, the pulmonary tissue is normal. In both lungs the bronchi are hyperæmic.

On the entire surface of the pleura where it is in contact with the pericardium there are numerous projecting pale nodules (miliary tubercles or granulations), and in addition one or two slightly enlarged cheesy glands on the anterior surface of the pericardium. A few nodules of a similar character are discovered over the surface of both lungs, especially at the bases.

The valves of the heart are normal.

Stomach is normal.

Spleen is somewhat enlarged.

Liver enlarged, weighing 4 lbs. 13½ oz. Its tissue is somewhat hyperæmic. On its surface one or two pale nodules are discovered.

Kidneys are normal in size. On section both present a few minute white nodules.

Intestines are normal.

The mesenteric glands are generally enlarged, but not cheesy.

[*Remarks by Dr Gairdner.*—That *paracentesis pericardii* is not an operation that can be frequently recommended with advantage may be fairly inferred from the fact that in more than twenty years' hospital experience as a physician of two great Infirmaries I have never, save on this one occasion, seen a case in which I was strongly tempted to propose it, either in my own practice or in consultation. I have, nevertheless, always held an opinion favourable to the operation, in a case either of distension of the pericardium alone, threatening life; or of pericardial effusion, complicated with other lesions much less dangerous as regards their immediate consequences. In the great majority of the cases that have occurred to me there has been either (1) a doubtful diagnosis; or (2) complications, themselves of severe or very threatening character, involving immediate risk to life; or (3) a state of the system so much debilitated by constitutional disease as to render any interference of this kind open to objection. In the present case there appeared to be at least a presumption that some benefit might possibly be obtained, notwithstanding the pleural effusion on left side; for the patient was by no means extremely exhausted at the time of the operation, and the state of the pulse was obviously due to pressure on the heart, preventing its expansion. That such mechanical impediment to the action of the heart should be consistent with an entire absence of orthopnoea, or even appreciable respiratory anxiety, as it undoubtedly was for some days after this man's admission, may be regarded as a remarkable fact, but is quite consistent with previous observations. Dr Walshe refers to a case in which sixty ounces of fluid had accumulated in the pericardium, and in which the patient lay "by choice flat on the back, with scarcely any pillow;" and there can be no doubt, I think, that the dorsal decubitus is sometimes rendered necessary by a tendency to syncope, which, however, was not very apparent in the present instance, as the patient, during the first days after admission, insisted on getting up to the water-closet, and also on walking about the ward, even while the nocturnal decubitus was perfectly recumbent, and was maintained apparently without the slightest difficulty or anxiety of any kind. The diagnosis in this case rested (in the absence of friction sound) upon the extension and peculiar form of the precordial dulness, the distance and muffling of the sounds, the vaulting of the lower part of the precordial region, the depression of the left lobe of the liver, and the state of the pulse. The diagnosis was not wrong, and I think it could hardly have been so as regards the mere presence of a

quantity of fluid; but it failed to inform us of the character of the fluid, the amount and position of the lymph, the degree of thickening of the pericardium; still more, it failed to indicate to what extent the action of the heart was controlled by these latter conditions; and thus the diagnosis, though absolutely correct, so far as it went, might have been pronounced wrong, or at least imperfect, as a foundation for prognosis and treatment. Still, I am of opinion even now, that there was a fair and reasonable prospect of some relief from the operation in this case; and its failure, owing obviously to the entanglement of the end of the canula in the masses of lymph on the visceral surface of the pericardium, is to be regretted, although it is sufficiently clear now that life could not have been much prolonged. It is somewhat difficult to understand how more fluid was not obtained, notwithstanding the obstacle above alluded to; for the canula was repeatedly half withdrawn and then pushed home again, and, besides, it was moved about in every direction in what seemed to be a free cavity in search of fluid, further attempts being only abandoned on account of the manifestations of suffering on the part of the patient. Still more puzzling is it, that with evidence of the canula being pushed home so as to partially penetrate the lymph of the visceral pericardium, there was no sense of jogging derived from the movements of the heart, and that the friction heard at this time on auscultation was respiratory, and not cardiac. The facts, however, are as stated in the report, and led at the time to a doubt as to the pericardium having been penetrated at all. Would an operation in the fourth intercostal space have been attended by a more successful result? or would it not rather have much increased the risk of wounding the heart?]

2. *General dropsy without albuminuria. Question of hydropericardium. Condensation of left lung. P.M. Scrofulous glands in the anterior mediastinum. Pleurisy and tubercular deposits. Hydronephrosis. Fifty round worms in the intestines. Remarks.*

J. N., a boy from the "Cumberland" training ship, aet. 13 years, was admitted to the Glasgow Royal Infirmary on June 11th, 1872. His condition resembled very much the appearance of a patient with dropsy after scarlet fever, but there was no history of exposure to scarlatina, and the urine was not albuminous. His health before this illness seems to have been good; he never had rheumatism, or indeed any serious illness that he could remember. He had been a little troubled with a cough since the beginning of winter, this had recently become worse, and for a month before admission he had suffered from a pain in the front of the chest; the pain, he said, began about the right side of the upper part of the sternum, and gradually extended downwards and to the left, and it had become most severe in the latter situation. It was constantly present, but was much aggravated by any attack of coughing. There was no expectoration.

The dropsy had only come on four days before admission, up to which time he had been running about pretty much as usual.

An examination of the chest showed the whole of the left side to be more or less dull. From the clavicle to the heart the percussion was almost absolutely dull, the upper and outer boundaries of the cardiac dulness could not be discriminated from the pulmonary, but what seemed to be the cardiac dulness could be traced about an inch to the right of the middle line. The dulness was less extreme in the lateral and posterior regions, and was even less still at the base. There was an apparent vaulting of the præcordial region and indeed some distension of the whole of the left side; it yielded a measurement of an inch and a half or two inches more than the right, but after consideration it seemed very possible that all these differences between the two sides might be due to a greater degree of anasarca on the left side; it was on this side that he chiefly lay. There was no distinct protrusion of the intercostal spaces anywhere.

The whole left side was the seat of crackling râles, some coarse and some fine; some of the râles were supposed to be due to friction, especially those heard in the lateral and posterior regions. The râles were quite distinctly audible over the normal site of the præcordial dulness. The respiration was bronchial in the upper lobe, and comparatively deficient in the lateral region, but nowhere absolutely suppressed. The *right* lung seemed mostly normal, some wheezing and mucous râles only being audible.

The impulse of the heart could be traced unduly to the right, and towards the epigastrium, but no distinct apex-beat could be defined. The sounds were rapid and weak, not superficial, but nowhere so much suppressed as to imply extreme effusion. There was no pericardial friction.

There was no great appearance of fever; the temperatures, however, were not recorded. The tongue was clean, the appetite was bad. The bowels were costive, but they acted with medicine. The urine was scanty, of acid reaction, had a specific gravity ranging from 1019 to 1025, and although repeatedly examined, was found to be totally devoid of albumen; it occasionally showed a deposit of lithates.

The patient seemed to improve for the first few days after admission, but there was no marked change of any kind; the dropsy did not yield to treatment, and the cough continued troublesome; no expectoration was seen. Some inclination to vomit was noticed shortly before death; the urine became still more scanty during the last few days of life, but no trace of uraemic symptoms appeared. He began to sink on the night of June 16th, and died on the morning of the 18th.

The *post-mortem* examination was made by Dr Joseph Coats about 30 hours after death. On removing the sternum, several hard and enlarged glands were found adhering to the pericardium, and also surrounding the lower part of the trachea and the bronchi. On section, they presented a firm, yellowish, and opaque appearance. The *left lung* was found coated

with soft lymph; there were partial adhesions, which, however, were not very firm, and the lymph contained a considerable quantity of pink fluid. This lung presented several greyish-yellow deposits. The largest was at the upper part of the lower lobe; it extended downwards for about an inch, and inwards towards the root of the lung; it was situated posteriorly, and did not reach the front. A similar smaller deposit existed about an inch below this, and, in addition, there were several smaller ones. The *right lung* was not adherent; a larger quantity of fluid existed in the pleural cavity on this side than on the left, but it was not excessive. A number of miliary nodules on the pleura, and several pale opaque deposits throughout the lung were found on this side.

On *microscopic examination* of the deposits in the glands and lungs, no appearance of cancerous structure was found. At the margin of the deposit in the lungs there was seen a firm layer of connective tissue, in the meshes of which, and within it, there were numerous round cells; but the bulk of the deposit consisted of a granular, indefinite, cheesy mass. The bronchial glands presented the structure of scrofulous glands—externally cellular, internally cheesy.

The *pericardium* contained only a small quantity of clear serum. The tissue of the heart was flabby, and globular polypi existed at the apex of the left ventricle, and also in the right ventricle. The heart was otherwise normal.

There was a moderate quantity of fluid in the peritoneal cavity. The *liver* presented one or two white nodules, and in the *spleen*, at its lower end, a pale, soft, distinctly demarcated patch was found. The *left kidney* was in an advanced state of hydronephrosis, and the cysts contained about a pint of dark straw-coloured fluid, having a Sp. Gr. of 1012. The ureter was not distended, and on its being cut, the fluid did not flow through it. The only cause of obstruction, therefore, seemed to be the valvular nature of the communication between the ureter and the pelvis of the kidney. The *right kidney* was of normal structure, and somewhat larger than usual.

In the small intestine, 50 lumbrici were found; a group of 16, about seven feet below the duodenum; another group of 14, about a foot further down; 3 more somewhat below this, and about five or six feet above the valve another collection of 17 worms. The mucous membrane of the intestines was normal. The *brain* was also normal.

Remarks.—The chief point of clinical interest in this case was the question that could not fail to be raised with a view to treatment, as to the possible existence of fluid in the pericardium, or pleura, such as to justify paracentesis. At first, the extended dull percussion over the heart, and the vaulting of the præcordial region, gave a bias to the diagnosis in this direction, which was still further favoured by the state of general anasarca, the imperfection of the cardiac sounds, and the loss of the distinct apex-beat. But further investigation showed, 1st, that the distinctness of the pulmonary râles, together with the absence of protrusion of the intercostal

spaces, made a large pleural effusion very improbable; 2nd, that the pulmonary râles were heard more distinctly over the cardiac region than could have been the case with a very large pericardial effusion; 3rd, the "vaulting" was apparently accounted for by external anasarca locally developed; 4th, the sounds of the heart, though feeble, were not altogether wanting in tone. Hence it was correctly inferred that no operative interference was admissible. But it is very difficult to feel sure of the correctness of the diagnosis under such circumstances; and unquestionably this insecurity of the diagnosis is one of the chief objections to paracentesis pericardii, at least in complicated cases. In the present instance all that could be regarded as certain was the dense and airless condition of the left lung, especially in its upper lobe, and some collateral affection of the pleura. The special form of the disease of the lung and of the glandular system, and the globular polypi of the heart, exercised, no doubt, an influence on the symptoms. The cause of the anasarca, also, was, and perhaps still remains, somewhat obscure. Perhaps the pressure of some of the mediastinal glands on the *venæ cavæ*, and the globular concretions in the heart may have had a nearly equal share in its production. The immense number of round worms in the intestines, without any special symptoms or apparent knowledge of the fact, was very remarkable. Notwithstanding the absence of albuminuria, the left kidney was almost completely destroyed, and the whole work of excretion must have been performed by the right for a considerable time before death.

W. T. G.

III.—CASES OF COMPOUND FRACTURE TREATED ANTISEPTICALLY.

Under the care of DR DEWAR.

Reported by MR THOMAS BUCHANAN.

1. D. M'K., age 22, admitted to the Royal Infirmary on January 16th, 1871, suffering from a compound fracture of the tibia and fibula in the middle third of the leg. The wound leading to the fracture was about the size of a sixpence; it was injected with 1 to 20 carbolic solution, dressed antiseptically with green protective and lac plaster 1 to 3. The leg was put up in a M'Intyre's splint. On changing the dressing for the third time a new wound was observed about 1 inch higher up than the first one, produced by the projecting end of the tibia. The whole was put up antiseptically, and the case did perfectly well, not a single drop of pus having been observed since admission. He was dismissed well on the 14th April, and sent to the Convalescent Home.

2. A. M'K., age 14, admitted March 14th, 1871, suffering from a compound fracture of the radius at its lower end, caused by a fall of 30 feet. The wound was syringed out with 1 to 20 carbolic water, and dressed with the new carbolized gauze. The fracture did perfectly well, and no

pus was observed during the progress of the case. He was dismissed well on the 13th May, 1871.

3. J. G., age 21, admitted April 29th, 1871, with a compound fracture of the left leg in the middle third. Both bones were broken. The accident was caused by patient falling from the deck of a ship into the hold. The external wound was about the size of a halfpenny. This was syringed out freely with 1 to 20 carbolic water, and dressed with green protective and lac plaster. The leg was put up in a M'Intyre's splint. The fracture did perfectly well, and the patient was dismissed nearly well on the 11th August, 1871.

4. H. C., age 12, admitted on July 3rd, 1871, suffering from a compound fracture of both bones of the forearm in the lower third. The wound was syringed out with 1 to 20 carbolic water, and then dressed antiseptically. The fracture did well, and the patient was dismissed well on the 18th of July, 1871.

5. M. B., age 50, admitted on August 2nd, 1871, suffering from a compound fracture of both bones of the leg $1\frac{1}{2}$ inches above the ankle. The external wound was about the size of a shilling; it was syringed out with 1 to 40 carbolic water, and dressed antiseptically with carbolized gauze. The fracture did perfectly well, and there was not a drop of pus seen during the treatment of the case. He was dismissed well on the 3rd November, 1871.

6. D. T., age 24, admitted September 20th, 1871, suffering from a compound fracture of the tibia and fibula, caused by a fall of coal in a mine. The wound was syringed with 1 to 20 carbolic water, and dressed antiseptically with gauze. The case did perfectly well, and he was dismissed well December 9th.

7. R. M., age 32, admitted January 29th, 1872, suffering from a severe compound fracture of ulna, near the elbow. There were two wounds, one on the outer side and one below the joint, and through the latter could be felt the splinters of the ulna. The fracture being a comminuted one, the wound was washed out with 1 to 20 carbolic water, and dressed antiseptically with gauze. There were no bad symptoms, and the fracture did very well. He was dismissed on the 4th March well.

8. C. M'D., age 34, admitted May 29th, 1871, suffering from a severe compound fracture of the radius. The wound was syringed out with 1 to 20 carbolic water, and then dressed antiseptically with carbolized gauze. The wound healed rapidly, and the patient was dismissed well on the 24th July, 1871.

9. E. P., age 16, admitted on the 28th June, suffering from a severe compound fracture of the humerus, there being about 2 inches of the upper fragment protruding. It was caused by the strap of some machinery. The wound was syringed out with 1 to 40 carbolic water, and dressed antiseptically with lac plaster. The fracture was put up in splints, with pads of oakum. The wound and fracture did perfectly well, and she was dismissed well on the 22nd August, 1871.

10. J. A., age 65, admitted April 18th, suffering from a simple fracture of the tibia and fibula, caused by the wheel of a bus passing over his leg. Owing to the great bruising of the soft parts, a large piece of the tissues, extending for about 8 inches in front of the tibia, sloughed. The wound was washed with 1 to 20 carbolic water, and then dressed with carbolic gauze. After the slough had separated the wound commenced to granulate, and is now completely skinned over, 26th July, 1872.

IV.—FOUR CASES OF FACIAL PARALYSIS SUCCESSFULLY TREATED WITH ELECTRICITY.

Reported by JAMES FINLAYSON, M.D.

THE following cases were sent to me by Dr Gairdner, during the present year, for electrical treatment. Three of them were hospital patients. They had all been subjected to more or less treatment, by blistering and otherwise, before they came under my care. They all improved rapidly under treatment.

CASE I. Mary M., a power-loom weaver, 19 years old, became conscious of something being wrong with her upper lip on February 19th, 1872, and this was soon found to be due to facial paralysis of the left side. She was treated for nine days with blisters and medicine (apparently iodide of potassium), but, as the disease was not disappearing, she was advised to enter the Royal Infirmary, and she was admitted on February 28th. No satisfactory explanation of the cause of the paralysis could be discovered. There was no history of rheumatism. She had had glandular swellings in the neck nine or ten years ago; these, however, had disappeared without suppurating, and had never returned. All the muscles of expression on the left side of the face were paralysed, and while laughing the distortion was very great. The eye could not be closed. The uvula was supposed at first to be deflected from the middle line, but Dr Gairdner afterwards thought this observation had been founded on an error. The hearing was good; no other nerves were affected. A blister was applied over the stylo-mastoid foramen on admission. Electrical treatment was begun on March 2nd. The muscles on the left side of the face were found to respond to induction currents of very moderate intensity, but the action was less energetic than in the case of the corresponding muscles on the opposite side. They were subsequently (March 16) tested with the constant galvanic current, and it was found that the paralysed muscles were hypersensitive to this form of electricity, responding more energetically than those on the sound side.

After four applications of the induction current (March 2, 4, 6, and 8), the patient was, for the first time, conscious of an improvement; this had been noticeable by others a few days earlier. The eyelid could now be closed by applying the current to the orbicularis.

March 14.—Other four applications. Feels that she can close the eye almost perfectly, but this power is retained only up till the morning after the faradisation. Lip and mouth are evidently improved.

April 6.—Faradisation has been repeated seventeen or eighteen times since last date. Iodide of potassium, which she had been taking, was stopped four days ago. Some glandular swellings have appeared under the left ear. She cannot take cod-liver oil, as ordered by Dr Gairdner. Muscles of the left side of face are now much more under control, and they have begun to partake in the expressions of the face. The eyelid closes well, and to-day, for the first time, the eye does not water while she is in the open air.

May 10.—Another blister was applied on 26th April, and kept running for some days. Faradisation has been repeated every second, and latterly every third day. Hypersensitiveness of the paralysed muscles to the constant current still continues. Response to faradisation is now nearly as good on the paralysed side as on the other. General health has been occasionally disturbed since admission by headache and febricula. Face almost natural.

May 11.—Dismissed. [Seen a month or two later. Face keeping better. General health and strength scarcely satisfactory. Recommended to the Sea-Side Homes.]

CASE II.—A young gentleman was sent to me on May 1st, 1872, by Dr Gairdner, whom he had been recommended to consult for a facial paralysis of the right side. He ordered two blisters to be applied, and he recommended him to my care. This paralysis, which began by affecting the right eyelid, was of fifteen days' duration, but it had supervened in the course of a glandular affection of the right side of the neck, which had begun a fortnight before that. The glandular swelling extended up to near the right ear, and threatened to break; this, however, was averted, and the swelling had become somewhat less. During his illness, severe pains were felt in the right side of the face, but they subsided under the use of bebeerine. The paralysis had appeared while he was using iodide of potassium. The closure of the eye had become nearly right by May 1st, but there was very marked paralysis of the other muscles supplied by the *portio dura*. The uvula was in the middle line, and no other nerves were affected.

The muscles of the right side of the face were faradised; they responded readily to currents of moderate strength, but they showed the characteristic sensitiveness to the constant current.

May 2nd.—Felt yesterday that, after the faradisation, he could move the ala of the nose. Face seems to have a little more movement. Faradisation repeated.

May 4th.—Repeated yesterday and to-day. Could whistle yesterday for first time.

May 6th.—Distinct improvement. Faradisation repeated. Constant current applied to glandular swelling.

May 7th.—Gland much smaller. Face still improving. Repeated faradisation.

May 10th.—The glandular swelling was treated on 8th and 10th with the constant current; an improvement followed, but the diminution was not of so marked a nature as on 7th. Faradisation applied daily since last note. Can move lower eyelid a little better.

June 1st.—Faradisation repeated with further benefit, four or five times in the fortnight subsequent to last note. Patient then went to the country for ten days, and returned much improved in health. Swelling gone. Very slight trace of paralysis remains. There is still a slight excess of sensitiveness to constant current on paralysed side. [Seen a month or so afterwards; improvement maintained.]

CASE III.—Neil M., aet. 33, a fisherman, was admitted to the Glasgow Royal Infirmary on June 2nd, 1872. In the middle of May he had a sudden affection of the right side of the face while fishing at night, and on admission he had “very manifest and considerable, although not extreme, paralysis of the *portio dura* of the right side.” Dr Carmichael, at Tarbert, had given him medicine (apparently iodide of potassium), and six blisters had been applied. On admission, it was thought that the uvula was drawn to the left; on examination, Dr Gairdner found the right arch of the palate to hang lower than the left, but the deviation of the uvula was doubtful. No other nerves were affected. The patient was ordered to have another blister over the stylo-mastoid foramen, and this was repeated on June 11.

The electrical condition of the muscles was tested on June 5. It was found that on the paralysed side the response of the muscles to induction currents was distinctly diminished as compared with the sound side; on the other hand, with the constant galvanic current the paralysed muscles responded more actively than those on the sound side. This difference in the action of the two currents was shown to the students on June 8th, but regular electrical treatment was not begun till the 18th, so as to await the result of the further blistering. There was at this date some degree of improvement, but the patient could not close his eye. The faradisation was repeated on the 20th and 21st, and immediately after this latter application it was found that he could close the eye almost perfectly.

June 22nd and 24th.—Repeated. Can close eye without an effort.

June 26th and 27th.—Repeated. A comparative deficiency in the action of the left occipito frontalis is the chief sign remaining of the paralysis. Difference in the sensitiveness of the paralysed muscles to the two currents continues.

June 28th.—Dismissed. [His wife reports in October that the condition of the face continues satisfactory.]

CASE IV.—Zechariah M., aet. 34, a boilermaker in Greenock, was admitted to the Glasgow Royal Infirmary on June 19th, 1872. For 13½ weeks there had been paralysis of the left side of the face. It began suddenly, and was associated with pain in the left side of the head; possibly it was due to exposure to the cold and windy weather then prevailing. Patient was unable to close his eye further than just to cover the cornea when the eyeball was turned up; the mouth and brow were also affected to a very marked extent. There was no affection of the uvula or palate. No other nerves were involved. About a month after the beginning of the affection his head occasionally had fits of shaking, and his right arm also was sometimes similarly affected. This shaking was observed even after admission to hospital, but very soon thereafter it ceased to be troublesome. He had been for a short time in the Greenock Infirmary, and was there treated by a succession of blisters to the nape of the neck and by purgatives, but apparently without any benefit. On June 20th the muscles were tested electrically. On the paralysed side they responded to moderate induction currents, but they acted much less energetically than those on the sound side. To the constant current the paralysed muscles were found to be hypersensitive. This distinctive reaction of the muscles was demonstrated a week afterwards, but regular electrical treatment was not begun till July 23rd. In the interval the patient had three blisters applied over the stylo-mastoid foramen, and two on the cheek over the trunk of the nerve. The shakings of the arm and head had quite disappeared; the cheek and eye were also a little better. On shutting the eye the lid covered the cornea, the eyeball being turned upwards, and, on violent exertion with drawing up of the cheek the aperture was almost concealed. He could now also make an attempt at whistling, an improvement which he dated from, and attributed to, the second experimental application of the electricity.

The electrical treatment consisted chiefly in faradisation of the paralysed muscles. The constant current was used occasionally chiefly for experimental purposes, and it was applied several times, at the request of the patient, to various parts, (behind the left ear, at the left side of the brow, and at the left side of the nose) on account of pains felt there, as he seemed to feel relief thereby. The following note in the Hospital Journal by Dr Gemmell, the resident assistant at the Infirmary, indicates the result of the treatment. There were 14 applications from July 23rd till August 13th. "August 13th: Patient dismissed to-day almost well. The muscles of the mouth and eye have recovered exceedingly well, those of the brow less so. For the last three weeks he has had the interrupted current applied [nearly] every day by Dr Finlayson, a visible improvement being appreciable after almost every application."

Remarks.—The treatment followed in these cases, although by no means new, is probably not yet so widely known as to be properly appreciated by the profession at large. The four cases were all very

nal group of glands (neck), but gradually all the glands of the neck, chest, and abdomen are successively involved. 3. In their anatomical structure the affected glands differ from those in the soft form, in the preponderance of the reticulum and in a true formation of connective tissue, this causing the much greater hardness of this form. 4. The spleen is similarly affected, its Malpighian follicles being the structures primarily attacked. The organ increases much in size. The disease is distinguished from scrofulous enlargement of the glands in respect that there is no tendency to inflammation or caseous degeneration, nor to inflammation of the tissues around the glands. The symptoms of the disease are chiefly these; great paleness of the skin and mucous membranes, rapid emaciation, early appearance of muscular weakness, palpitation of the heart, with a systolic murmur at the apex, frequent pulse, with normal temperature, tendency to profuse epistaxis; in females, suppression or irregularity of menstruation, dropsy, pain in the abdomen, from enlargement of the spleen. The course is very rapid, in some cases death occurring three or four months after the first appearance of symptoms, but the average being 1-2 years, life being seldom prolonged to 3-3½ years. The treatment is very unsatisfactory, there was in one case a temporary diminution in the size of the spleen and glands during the use of iodine and iron, but without any relief of the general symptoms.

XXXIV.—The Hæmoglobin in the Blood in Diseases (*Quincke*).—

The author gives tables of the relative amount of hæmoglobin in the blood in several diseases, determined by the spectrum analysis method. He found it reduced in chlorosis, leuchæmia, and nephritis.

XXXV. **Incubation of Small-Pox** (*Obermeier*).—This paper contains many important facts in relation to the infection of persons with small-pox and other points, but we merely notice some observations in respect to incubation. The duration of the incubation varied from 5 to 13 days, most frequently 11, 12, and 8 days. During this stage, the patients frequently had headache and felt unwell, and very commonly in its last days complained of catarrh of the pharynx. The length of this period had no distinct relation to the intensity of the disease, if anything, a long incubation period was most commonly followed by a milder attack.

VOL. LV., PARTS I. AND II., JUNE, 1872.

CONTENTS.—I. Further observations on retarded motor conduction, by E. Leyden and v. Wittich, Königsberg. II. The influence of phosphorus on the organism, an experimental study, by Dr Georg Wegner, Berlin. (Plates I. to III.) III. On the retrograde changes of callus, by Dr H. Lossen, Heidelberg. (Plate IV, fig. 1 to 9.) IV. The development of cancer, by Prof. Waldeyer, M.D., Breslau. (Second article. See this Archiv, Vol. XLI.) (Plates V. to IX.) V. Contribution to the process of cicatrisation of granulating surfaces, by Dr M. Schüller, Hanover. (Plates X. to XI.) VI. Has the blood effused into the air passages any etiological significance for phthisis pulmonalis? by Dr J. Sommerbrodt, Breslau. (Plate XII, fig. 1 to 5.) VII. On the varicose hypertrophy of the nerve fibres, by Dr M. Roth, Greifswald. (Plate XII., fig. 6 to 12.) VIII. Arthritis deformans of both shoulders and elbows, and of the left hip-joint, by Dr A. Weichselbaum, Vienna. (Plate XIII., fig. 1 to 2.) IX. Organisms in the lymph of small-pox, by Dr F. Cohn, Breslau, with three woodcuts. X. Smaller

Communications—1. Tyrosine in the sputum, by Prof. Leyden, now in Strassburg. (Plate IV., fig. 10.) 2. Peculiar case of a combined valvular lesion of the left heart, by Dr M. Bernhardt, Berlin. (Plate XIII., fig. 3.) 3. Cancer of the neck of the uterus in its initial stages, by Prof. Hegar, Freiburg. 4. Limited attacks of cholera in the Charité of Berlin in 1871, by Dr Weisbach. 5. Historical notice as to the opinion of the protective power of vaccination, by Dr W. Stricker, Frankfort. 6. The pathology of malignant pustule, by E. Semmer, Dorpat. 7. On the composition of fluids which are evacuated from the hip-joint in arthritis deformans, by Prof. F. Hoppe-Seyler, now in Strassburg. 8. On the epithelioma of the thyroid gland, by Prof. C. J. Eberth, Zürich. XI. Extracts and Reviews. Yearly record on the condition of medical matters, the hospitals, and the general sanitary relations of the city of Frankfort. 14th year (1870).

II. Influence of Phosphorus on the Organism (*Wegner*).—The author, at the outset of this paper, details the case of a former worker in a lucifer-match factory, in whom a trivial injury to the leg set up a severe periostitis. This led him to suppose that phosphorus may have a special action on the osseous system, and he proceeded to test the idea by experiments on animals. In describing the results of these experiments, he treats, first, of the influence of phosphorus on the stomach and liver, and, secondly, on the osseous system. It was found that by moderate doses violent catarrh of the stomach was produced, resulting in great thickening of the mucous coat, pigmentation of this coat, and the formation of flat ulcers. Such moderate doses produced in the liver an interstitial inflammation, exactly similar to that which results in the cirrhosis of man. In the rabbits experimented on, the phosphorus acted as an irritant to the interstitial connective tissue, and produced a new formation, which, by its contraction, altered the liver, till it completely resembled the usual contracted cirrhotic form. Of extreme interest and importance are the results of the author's observations as to the influence of phosphorus on the osseous system. The well-known affections of the jaws in workers in lucifer-match factories seems to be the result of the direct action of the vapour of phosphorus on the bones and periosteum. To determine this, he exposed rabbits to the vapour of phosphorus, and he found that there was a very marked irritation of the periosteum, evidenced by a great production of new bone on the surface of the jaws, with suppuration, an ossifying periostitis therefore, with suppuration. That the phosphorus had no special affinity for the jaws, but only attacked them because they are much more exposed than other bones, was proved by the fact that when, by incision, the periosteum of the tibia was exposed, the vapour produced a similar ossifying periostitis there. Next, as to the general action of phosphorus on the osseous system, it was found that small doses administered by the stomach, much smaller than those which produce the violent catarrh mentioned above, produce a simple formative irritation of the entire osseous system. This was very evident in the bones of growing animals. It is well-known that in growing bones the tissue, when first formed from the cartilage, is loose and spongy—thin bony trabeculae including large medullary spaces. There is thus just within the ossifying margin a layer of spongy bone. But in cases where phosphorus had been given to growing animals, it was found that the new bone which had been formed during the administration of the phosphorus was dense and compact. The cartilage had become directly converted into dense bone, and, microscopically, the transformation of the cartilage cells into bone corpuscles could be traced. Similarly, also, the periosteum was stimulated to increased new formation of dense bone. The question arises

here, whether the phosphorus acts as a direct stimulus to the osseous system, or produces these effects simply by providing the material necessary for the formation of bone. An experiment made on hens seems to answer this question in favour of the former supposition. Phosphorus was administered to hens while they were supplied with food devoid of calcareous salts, and it was found that there was a great production of *osteoid* tissue, which, for want of the proper material, could not be converted into *osseous*, a condition, in fact, presenting all the histological characters of rickets. The conclusion is still further strengthened by the fact that phosphoric acid and the phosphates seemed to have no direct stimulating action on the osseous system such as phosphorus itself. In respect to the therapeutic use of phosphorus, these observations are likely to prove of great importance. The author has convinced himself that phosphorus aids the growth of the osseous system in weakly children; that it also increases the formation of new bone in fractures, excisions, and transplantations of periosteum. He has no experience of its effects in osteomalachia, but expects that it will prove of service, while in rickets it is probable that its effect will not be advantageous. As to the mode of administering the agent, it is of great importance to get it uniformly mixed in the vehicle which is used. After various experiences, he has fallen on the following prescription:—R. Phosphori puri 0·03 ($\frac{1}{3}$ gr.), redige in pulverem subtilissimum ope syru^{pi} simpl. 7·5 (2 drms.), calefactis et conquassatis usque ad refrigerationem adde, Pulv. rad. Glycerrh. 10·0 (158 grs.), Pulv. gummi arab. 5·0 (79 grs.), Pulv. tragacanth 2·5 (40 grs.). M. f. pil. No. 200. These very small doses were for young rabbits at the outset, but the form can well be imitated in administering the agent to man.

III. The Retrograde Changes of Callus (*Lossen*).—From the examination of numerous preparations, chiefly of fractures in different stages, this author concludes that in the changes which occur in the callus after the union of fractures there are two processes involved. The end to which these processes tend, is, as every one knows, to restore the bone as much as possible to the condition of the normal bone, and this result is brought about on the one hand by the absorption of part of the already formed callus, and on the other by the formation of fresh callus where this is necessary for moulding the bone into a more normal shape. The former of these phenomena is effected by increase of the medullary spaces, a process comparable with rarifying osteitis, and the latter by an ossifying osteitis. To the callus which is produced by the latter process, and which is permanent, the old name of definitive callus may be well applied.

IV. The Development of Cancer (*Waldeyer*).—This is a very long and elaborate paper, but the material investigated by the author was very extensive, and the subject a very important one. A paper on the same subject was communicated by the author in Vol. XLI. of this Archiv, and in the four years that have elapsed since then, he has examined 203 cases of cancer, with a view to determining their mode of development. It has been often pointed out that the characteristic cells of cancers are of epithelial nature, epithelial in their individual characters, and also in their mode of grouping. And now, at the outset, the author seeks to show that the four chief groups of tissues in the animal body are not interchangeable. That, for instance, whether we look to normal or pathological processes, muscle or nerve is never developed from connective-tissue, or epithelium from any other of the groups. In the embryo we have at first a collection of cells which do not present the special characters of any of these four tissue-groups, but from the moment when these cells show a tendency to develop

into one form of tissue, there is no longer any interchange possible. The descendents of these developing in the direction of muscle, nerve, epithelium, and connective-tissue, always develop also in the direction of these tissues respectively. This itself would make it extremely probable that cancers, presenting in their essential constituents the type of epithelial cells, are developed from the pre-existing epithelial structures of the body. And in his examination of these cases of cancer to the number of 203, the author finds the idea again confirmed. In all localities where tumours of distinctly cancerous structure exist, he found that "new-formed epithelial cell-masses are always connected with pre-existing epithelium, that no single observation supports the idea that the development of these cell-masses is to be sought for, in wander cells, in fixed connective-tissue corpuscles, in blood or lymphatic endothelium, or in any other cell." Cancer is thus looked on as essentially in all cases an epithelioma, and it should be described as an "atypic epithelial tumour," being distinguished from other epithelial tumours (such as warts, &c.,) by its atypic development. On a similar principle he would describe the sarcoma as an atypic connective tissue tumour, the two being comparable in this respect, that in both there is an unlimited growth of atypic cells, these cells being in the one case epithelial, and in the other, of the connective-tissue type. These observations apply to primary cancers, which present considerable differences from secondary cancerous growths. In primary cancers the disease, in accordance with its mode of development, is usually diffuse, infiltrated, might perhaps be more correctly termed a cancerous degeneration, than tumour. In secondary cancers on the other hand, the disease springs always from a distinct focus, which has been conveyed from the primary growth, and so it occurs in more definite masses, which occupy somewhat the position of parasites in a foreign tissue. The author also remarks how soon primary cancers tend to send their cellular masses into the lymphatic vessels, this process having been well observed by Köster, and interpreted by him to mean that the cancer developed from the endothelium of the lymphatic vessels. It may perhaps be for the benefit of the English medical profession to know that this author makes, in one or two foot notes, some not very complimentary remarks on the diagnosis of cancerous and other tumours by English writers. The description of such tumours is almost uniformly incorrect or insufficient to enable any one to place confidence in the diagnosis, and the names are often applied with sublime indifference. A perusal of the English journals in this reference, must convince one that Waldeyer's strictures are by no means undeserved.

VI. *Hæmoptisis, a Determining Cause of Phthisis* (*Sommerbrodt*).—

It is a subject of considerable discussion among German writers, whether the assertion of Niemeyer and others is correct, that effusion of blood into the air passages tends to induce phthisis pulmonalis. An article abstracted in these pages some time ago answered this question in the negative; the present writer, on the ground of experiments on animals, takes the opposite view. In these experiments he found that blood effused into the trachea is not readily expectorated, but finds its way to the lung-alveoli, where it induces a catarrhal inflammation. In healthy animals, this catarrh was recovered from, and by this fact he accounts for the negative results of some authors. But in human beings predisposed to consumption, he supposes that the catarrhal pneumonia, resulting from the hæmoptisis, may be looked on as one among the many determining agents which lead to phthisis in such predisposed persons. Hence, after hæmoptisis, care should be taken to treat the catarrhal pneumonia, which is its immediate consequence.

IX. Organisms in Small-Pox and Vaccine Lymph (*Cohn*).—It has been already known that the lymph of small-pox and vaccinia contains numerous organisms, but their exact nature is somewhat undetermined. The organisms are minute globular bodies, which are often grouped together, but do not possess spontaneous movement. The author found that, when the lymph, after removal from the body, is kept at the temperature of the body, and secured from evaporation and contamination, the organisms increase in number up to a certain point. He looks on these bodies as spherical bacteria, and would name them from their shape *microsphæra*. Spherical bacteria of similar appearance, and also devoid of the power of voluntary motion, have previously been found in urine, milk, albumen, &c., and in these substances they act as ferments tending to split up the chemical molecules. The author supposes that these small-pox *microsphæra* may have a similar influence on the fluids of the body, and so produce the poison which leads to the symptoms of that disease.

X. 2. Peculiar Valvular Disease of Left Heart (*Bernhardt*).—In this brief paper a case of very peculiar disease of the aortic and mitral valves is recorded. The semilunar folds of the aortic valve had grown together, and from them projected a flattened roundish outgrowth about $2\frac{1}{2}$ to 3 Cm. (about an inch) in height. The surface was rough and irregular, and was covered with considerable layers of coagula. Opposite this outgrowth now, the anterior curtain of the mitral was perforated, the pressure having produced atrophy and loss of substance of the curtain. During life, as shown by the signs and symptoms, the pressure produced considerable obstruction of the orifice.

STRICKER'S MEDIZINISCHE JAHRBÜCHER.

PART I. 1872.

CONTENTS.—I. On paralysis pseudo-hypertrophica, by Dr Philipp Knoll, Prague. II. On the influence of respiration on the circulation, by E. Hering. III. Experimental investigations on the movements of the uterus, by Dr L. Oser and Dr W. Schlesinger, junior. IV. Contributions on the mechanism of the heart, by Dr E. Kolisko. V. On the possibility of the diagnosis of Syphilis by the microscopic examination of the blood, by Dr Losterfer. VI. Supplement to the contribution of Dr Losterfer, by S. Stricker. *Appendix*—Report of the surgical clinique of Prof. v. Dumreicher in Vienna for 1869-70.

I. Paralysis Pseudo-Hypertrophica (*Knoll*).—As a general account of this disease has been recently given in this *Journal* (for May), by Dr Davidson, it will not be necessary here to abstract the description of the present author, so far as the usual features of the disease are concerned. The case now recorded is, however, peculiar in respect of the actual alteration of the muscles, and this deserves special notice. The muscular fibres themselves showed the usual transverse markings, and were, most of them, of normal thickness, some, however, being thinner, and a few markedly thicker than normal. He found now that the hypertrophy of the muscle, as a whole, was due to an increased production of connective tissue between the muscular fibres and bundles, but that this interstitial growth of connective tissue was without the production of fat, as in the cases previously observed. This condition of the muscles is well shown by illustrations added to the paper. In reference to the pathology of the disease, the author considers

that it originates in the nervous system, and not in the muscles. He founds this conclusion chiefly on two considerations—first, weakness or paresis of the muscles appears before the peculiar hypertrophy; and, second, an increase of the interstitial connective tissue of muscle has been observed after nerves have been cut through. The increase in the connective tissue here is not to be looked on as separating the case from those in which there is a great development of fat, the close relation of adipose and connective tissue rendering the two conditions closely analogous.

II. Effects of Forced Expansion of the Lungs on the Circulation (Hering).—This is an extremely complete and well-wrought-out paper. It is a matter of observation, that, when a tube is introduced into the trachea of an animal, and the lungs blown up, either by bellows or the lungs of the operator, beyond their normal expansion, and the chest then kept in this state of forced inspiration by closing the tube for some seconds, there is, as a result, a very great increase in the pulse-rate. This being shown, a series of experiments were devised, with a view to determining the *modus operandi* of the forced expansion of the lungs. The results are contained in a series of propositions, each of which is subjected to a most thorough experimental proof in the original paper. The results alone can be related here. It is first shown that the increased pulse-rate cannot be the result of increased pressure of the over-expanded lungs on the surface of the heart. Among other proofs of this proposition, the following experiment is worthy of notice. A tube was inserted into the pleural cavity of one side, in such a manner as to enable the pleural sac to be blown up, thus producing an artificial pneumo-thorax. Distension of the thorax, and pressure on the heart, could thus be produced without expansion of the lung, and it was found that there was no increase of the pulse-rate. On the other hand, if, after the pleural sac had been thus distended, the air was then let out, so that the lung could again expand, the simple return of the lung to its normal expansion, acting under the circumstances like an over-expansion, was sufficient to determine increased pulse-rate. The next proposition, that the increased pulse-rate is not due to increased intravascular pressure, can be deduced from the same experiment. For, during the pneumo-thorax, there would be far greater obstruction to the flow of blood than after its removal, and yet there was no acceleration. The acceleration is further shown not to be the result of any alteration in the interchange of gases during forced expansion, nor of dislocation of the heart. It is concluded, however, and this entirely on experimental grounds, that the acceleration is due to a reflex action in which the vagus nerve is concerned. It is known that the vagus nerves have an important retarding influence on the heart's action. When the vagi are cut in certain animals the pulse-rate is enormously increased, and it is supposed that there are in the brain certain so-called depressor centres, which communicate through the vagi with the ganglia which are known to exist in the heart itself, and by this means regulate the contractions. There is thus a continuous action of these depressor centres, just as there is a continuous action of the vaso-motor centres keeping the vessels in the moderate degree of contraction known as the state of tonicity. Now the effect of over-expansion of the lungs seems to be, that an irritation of the sensitive nerves of the lungs takes place, and this irritation has a paralysing influence on the depressor centres of the heart, the controlling action of which being withdrawn the heart increases in its pulse-rate. These sensitive nerves in the lung, therefore, stand in a similar relation to the heart depressor centres, to that in which a certain nerve recently discovered and named depressor nerve stands to the vaso-motor depressor centres.

V.-VI. Losterfer's Syphilis Corpuscles—The assertion made by Losterfer that he had been able to develop peculiar bodies in the blood of syphilitics has been met by considerable opposition, and in the present article he describes his processes, and refers to certain tests of the accuracy of his facts to which he has submitted himself. There are seven tests mentioned, in some of which Stricker and in others of which Hebra, gave Losterfer a number of slides containing specimens of blood, partly from syphilitic and partly from non-syphilitic persons, and in each of the tests the author discriminated correctly which were syphilitic and which not. The bodies which he has named *syphilis-corpuscles* are not found in the blood on its removal from the patient, but develop in it when kept for a few days in a moist chamber. On the first two days there is generally nothing abnormal to be seen, but generally on the fourth or fifth appear small glancing bodies, which continue to increase in size and number. These bodies sometimes attained in a few days the size of shrivelled red blood corpuscles, or even exceeded that, at the same time they presented buds projecting from their bodies which are usually globular. When the specimens are kept for from eight to ten days, vacuoles develop in the bodies. The author adds to his paper the reports of ten cases of syphilis in the blood of whom he developed these bodies. From the consideration of these it appears that the corpuscles can be developed at all stages of syphilis.

In the supplementary paper by Stricker, he partly confirms Losterfer's observations, and takes exception to the position taken up by Prof. Wedl in opposing Losterfer without having properly considered his method of preparation.

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

PARTS V. AND VI. 1871.

CONTENTS.—I. Something on *Halodactylus diaphanus* Farre (*concluded*), by Dr R. Hartmann. II. Contributions to physiological optics, by Dr Franz Boll, Berlin. III. On a new mode of production of melituria, by Dr Bock and Dr Hoffmann, Berlin. IV. On the influence of collateral currents in the body (*Körperliche Nebenleitungen*) on the current of the gastrocnemius of the frog, by E. Du Bois-Reymond. V. Introduction to the use of the round compensator, by E. Du Bois-Reymond. VI. On the finer structure of the cell wall of the Bacillariacea, particularly of the *Triceratium Favus* Ehrbg, and of the *Pleurosigma*, by Otto Müller (Plate XV.) VII. On the processes of development within the seminal tubules, by Dr Fr. Merkel, Göttingen (Plate XVIII.) VIII. On a tibio-astragalus anticus muscle in man, by Dr W. Gruber (Plate XVI.) IX. On the muscle and the new bursa mucosa ilio-costo-cervicalis at the tubercle of the first rib, and on certain accidental bursæ mucosæ on the back, by the same (Plate XVI. B.). X. Osteological notes on the South American Armadillo, by H. Burmeister (Plate XVIII.) XI. On the disturbances of muscular innervation, and of the conception of retention in space, produced by galvanizing the head, by Ed. Hitzig. XII. Further investigations on the physiology of the brain, by E. Hitzig.

II. Vision with the Compound Eye of Insects (Boll).—In relation to the question whether, in the compound eye of insects, each separate facet gives a separate complete image, or whether an image is only produced by the co-operation of many, the author declares himself in favour of the latter view. In the first place, though it has been shown by Max

Schultze that each cone of the compound eye has at its apex a number of nerve fibres, yet these are not a true retina, because they are not backed with pigment, and also they do not afford sufficient nerve terminations to form a true retina. But again, the absence in these eyes of the power of accommodation is strongly against the idea that each facet is able to produce a complete image. And lastly, the animals have not a sufficiently developed central nervous system to combine and appreciate over 100 different images.

III. New Mode of Production of Melituria (*Bock & Hoffmann*).—In experiments on animals these authors found, that by the continuous injection into the arteries of animals in large quantity of a one per cent. solution of common salt, sugar appeared in the urine. Soon after the injection was commenced the animal (usually a rabbit) begins to secrete a large quantity of urine, which, as the injection continues, soon becomes appreciably saccharine, this result being a constant one. But as the injection is still continued, by-and-by the sugar lessens in quantity, and finally disappears, though the polyuria continues. When animals were killed in this latter stage, the liver was found in all cases to be free from sugar and glycogen. But when examined before the stage of melituria had passed away there was always sugar in the liver though glycogen was sometimes absent. The author winds up his paper with inquiring the cause of the melituria. Is it a simple washing out of the sugar in the liver? Or is it in some way due to the dilution of the blood? Or to the high pressure within the vessels? Or to one of these two latter acting on the nervous system? To these questions the author does not venture a reply.

PART I. 1872.

I. Investigations on the production of heat and the interchange of material, by Dr H. Senator, Berlin. II. The finer structure of the nerve-terminations of the urinary bladder of the frog, by Dr M. Lavdowsky, St Petersburg. (Plate I.) III. A contribution to the histology of the croupous process, by Dr M. Boldyrew, Kasau. (Plate II. A.) IV. On the kidneys of the African elephant, by Dr W. Dönitz. (Plate II. B.) V. On the suspension of certain physical laws by means of unknown forces in vegetable and animal organisms, by Dr Dönhoff, Orsoy. VI. On the determination of the sulphur of taurocholic acid in bile, first contribution, by Dr E. Külz, Marburg. VII. Contributions to the zoological and zootomical knowledge of the so-called anthropomorphous apes, by R. Hartmann. (Pates III. and IV.).

V. The Suspension of Physical Laws by Vegetables and Animals. (*Dönhoff*).—By various observations, chiefly with the eggs of animals and the leaves of plants, the author shows that certain physical laws are suspended by such living organisms. In the first place, the eggs of silkworms and the pupa of butterflies can be kept in the live state for an indefinite period of time without drying; but if they be killed, by boiling water, for instance, they dry in a few days. Again, certain eggs, as of the bee, withstand a degree of cold considerably below the freezing point without their juices freezing. And, lastly, it is found that while dead cells when placed in water communicate to water their dissolved material, living cells do not so give up the substances which they hold in solution.

Medical Intelligence, &c.

—o—

GLASGOW MATERNITY HOSPITAL.

Half-Yearly Report from 15th November, 1871, to 15th May, 1872.

| MOTHERS. | | | | | INFANTS, &c. | | | | | | | | | | | | |
|----------|-----|-------------------|---------|---------|--------------|--------|-------------|----------|-------------|----------------|--------|--------|-----------|-----------|------------|------------------|----------|
| | No. | Social Condition. | | | No. | Males. | | Females. | | Presentations. | | | | | | Operative Cases. | |
| | | Married. | Widows. | Single. | | Alive. | Still-born. | Alive. | Still-born. | Cranial. | Other. | Twins. | Triplets. | Abortion. | Premature. | Forceps. | Version. |
| In-door | 166 | 43 | 8 | 115 | 167 | 74 | 10 | 77 | 6 | 160 | 7 | 1 | 0 | 0 | 8 | 6 | 1 |
| Out-door | 362 | 319 | 6 | 37 | 369 | 181 | 27 | 142 | 19 | 347 | 21 | 7 | 0 | 5 | 20 | 7 | 5 |
| Total... | 528 | 362 | 14 | 152 | 536 | 255 | 37 | 219 | 25 | 507 | 28 | 8 | 0 | 5 | 28 | 13 | 6 |

Average Duration of Labour.

Primiparæ.
 1st stage 11·57 hours
 2nd “ 3·34 “
 3rd “ 9·75 mins.

Pluriparæ.
 1st stage 6·05 hours.
 2nd “ 1·64 “
 3rd “ 7·36 mins.

| | | |
|--|-----|--------------|
| Greatest weight of child at full time, | 10 | lbs. |
| Least weight | “ | “ 4 |
| Average | “ | “ 7·43 |
| Greatest length | “ | “ 24 inches. |
| Least length | “ | “ 13 |
| Average | “ | “ 18·82 |
| Greatest weight of placenta, | - - | 3·50 lbs. |
| Least | “ | “ ·75 |
| Average | “ | “ 1·28 |
| Greatest length of cord, - - | - - | 46 inches. |
| Least | “ | “ 11 |
| Average | “ | “ 20·44 |

Remarks.—The death which occurred in the hospital was caused by pulmonary consumption. For six months previous to admission this patient had been labouring under the disease, and though the confinement was natural and easy, she sank from exhaustion ten days after her delivery.

Of the three deaths among the out-door patients, one was a case of deformity of the pelvis, which resulted in rupture of the uterus. The second

was one of post partum hæmorrhage, and the third was from an attack of scarlatina four days after giving birth to the child. The following case is the only other which calls for special notice. Mrs A——, aged 35, fully eight months advanced in pregnancy, was admitted into the house on Friday evening, 24th November last. The report stated that she had been nine times pregnant, but had only twice completed the full period of uterogestation. On these two occasions, it would appear from her statement that craniotomy had been had recourse to. The other seven times premature labour had been induced about the seventh month. Six days prior to her admission to the hospital, a surgeon had been called in by the woman to induce premature labour. After learning the above history and making a careful examination, he considered it necessary to do so. For this purpose he introduced the uterine sound into what he believed to be the os uteri, but as this produced no effect, he discovered, on a more careful examination, two days afterwards, that the instrument had been inserted into an old cicatrix with a fistulous opening on the posterior wall of the cervix uteri. He then proceeded to puncture the membranes, and on the following day uterine action began. In the evening the funis presented, and on the following morning the left foot was also felt in the upper part of the vagina. As delivery could not be effected, the next day she was admitted into the hospital. It was then ascertained that the funis and left foot still presented, and that a large tumour, which proved to be the promontory of the sacrum, projected forwards and downwards into the cavity of the pelvis, diminishing the antero-posterior diameter at the brim to about two inches. Dr Wilson, who was in attendance, with great difficulty extracted the body of the child, but found it impossible at the time to bring away the head. The patient, being much exhausted, was allowed to rest for some time, and had stimulants administered, when she rallied considerably. The uterus then began to act more vigorously, but the head was so impacted that spontaneous expulsion was rendered impossible. She therefore required farther assistance, and the head was ultimately delivered by Dr Tannahill. The patient made a good recovery.

R. D. T.

THE GLASGOW AND WEST OF SCOTLAND MEDICAL ASSOCIATION.

THE annual meeting of the Association was held in the Faculty Hall, 242 St Vincent Street, on the 16th October, at 4 p.m. There was a good attendance of members. Dr SCOTT ORR was voted to the chair.

Dr FINLAYSON read the

“ANNUAL REPORT OF THE GENERAL BUSINESS COMMITTEE FOR THE YEAR
ENDING 30TH SEPT., 1872.

“During the year your Committee met four times.

“The appointment, made at last annual meeting, of a separate Secretary for the general business purposes of the Committee and Association has been found to lessen the pressure of work which formerly rested on Dr Russell from the combination of business and editorial duties.

“The present membership of the Association comprises 63 guaranteeing members and 242 ordinary members—305 in all. This number includes 18 who have not yet paid their subscriptions ; but as several of these are abroad,

and pay through booksellers and other agents, it is supposed that only a few subscriptions will be really lost. The names of the 18 are—

* * * * *

“At the beginning of the present year an effort was made to extend the circulation of the *Journal*, and several members of the Committee and Association lent valuable assistance in the canvass which was then made. The result was so satisfactory that 44 new names were added this year to the membership. Your Committee, however, would urge upon the members the propriety of their endeavouring to gain new adherents to the Association, as from death, resignation, and non-payment of subscriptions, there is every year a certain number removed from the list.

“Since last report, the following deaths have been notified:—Mr James Doig, Alford; Mr William Allan, Patna; Dr Wm. Prichard, Partick.

“The membership of the Association being larger than ever it has been, the financial result is favourable. It would have been even more so had not an extra charge been made for printing the *Journal*, amounting to £16. The Committee regret to announce that a further increase of £14 a year is demanded by the printer in his estimate for next volume; but, in the present state of the markets, this demand is not unnatural. This increase, however, does not at present necessitate any addition to the price of the *Journal*.

“The following is an abstract of the Treasurer's accounts:—Total income for the year, £208 0s 9½d; total expenditure, £193 0s 6d. This leaves a balance of £15 0s 3½d, which, if added to the balance at the credit of the Association at last annual meeting, brings up the total to £123 5s 6d.”

Dr RUSSELL then read

“ANNUAL REPORT OF EDITORIAL COMMITTEE, 1871-72.

“Your Committee are happy to be able to report that the circulation of the *Journal* has this year advanced considerably—a circumstance for which the General Business Secretary's exertions must receive the credit. The list of members published at the end of last number contains 305 names, which is the largest hitherto issued. Some 12 copies were sold to Libraries and Booksellers. The publishers sold 34 odd numbers of the past year, besides a few of previous.

“The unpaid circulation was also increased in the department of Exchanges, which now number 39 copies.

“An effort was made to extend our gratis distribution to a few Students' Reading Rooms in Paris; but one of the members of the Association, Dr W. L. Reid, who kindly undertook our commission during a visit to Paris, found that there were no Reading Rooms where the *Journal* would be accessible to students.

“The general rise of the labour market has affected the cost of producing the *Journal* very considerably, as your Business Secretary has pointed out, and it would be well to increase the circulation still more, so as to enable us to extend the same aid to authors requiring illustrations as hitherto.

“The Editorial Committee regret to report that, while your *Journal* is financially prosperous, and increasing its circulation, it is still in literary difficulties. The compilation of the contents of each number is laborious, and

the delay in waiting for sufficient material is not the less vexatious to all parties that it is unavoidable. They would appeal more particularly to the teachers of the Medical Schools, and to those who hold hospital appointments, for more hearty literary support."

On the motion of the CHAIRMAN, the reports were adopted, and the guaranteeing members agreed to carry forward this year's balance, and to add it to those of the previous years.

Some conversation took place regarding the increased cost of printing the *Journal*, and some dissatisfaction was expressed at the greatly increased rate charged by the printer for reprints of articles desired by authors. Although such arrangements for reprints are exclusively private as between the authors and the printers, Dr Russell was requested to communicate to Messrs. Dunn & Wright the complaints made by several members as to the exorbitant nature of their charges.

The election of Office-bearers for the ensuing year was then proceeded with, and the following were elected:—

President—Prof. ALLEN THOMSON, M.D., F.R.S.

Vice-Presidents—Dr W. T. GAIRDNER and Dr EBEN. WATSON.

Treasurer—Dr JAS. STEVEN, 331 Renfrew Street.

Editorial Secretary—Dr RUSSELL, 278 Bath Street.

General Business Secretary—Dr FINLAYSON, 351 Bath Street.

General Business Committee.

| | | |
|------------------|----------------------|---------------------|
| PRESIDENT, | } <i>Ex officio.</i> | Dr GEO. BUCHANAN. |
| VICE-PRESIDENTS, | | Dr JOHN COATS. |
| TREASURER, | | Dr JOS. COATS. |
| SECRETARIES, | | Dr ALEX. ROBERTSON. |
| Dr THOS. REID. | | Dr JOHN WILSON. |
| Dr HUGH MILLER. | | Dr SCOTT ORR. |

A vote of thanks to the Officials terminated the proceedings.

(The Transactions of the Medico-Chirurgical Society are in type, but must be reserved for next Number.)

THE GLASGOW MEDICAL JOURNAL.

February, 1873.

Original Articles.

I.—ON PUTREFIERS AND ANTISEPTICS.

By JOHN DOUGALL, M.D., Medical Officer of Health for the Burgh of Kinning Park, Glasgow.

(Continued from Nov. No., p. 58.)

The exact average relative antifermentive and anti-putrefactive powers of the various bodies and groups cannot be correctly ascertained in consequence of the blank spaces in the tables, given on the next four pages, but assuming these to be filled in with 100 (days), the following approximate averages are obtained from the groups:—

| Name of Group. | Antiputrefactive Power. | Antifermentive Power. | Total Antiseptic Power. |
|--|-------------------------|-----------------------|-------------------------|
| I. Metallic Salts,..... | 46·6 | 64·1 | 110·7 |
| II. Organic Acids,..... | 42·1 | 43·6 | 85·7 |
| III. Inorganic Acids,..... | 35·6 | 37·7 | 73·3 |
| IV. Salts of the Alkaline Earths,..... | 29·6 | 41 | 70·6 |
| V. Organic Salts,..... | 12·7 | 44·4 | 57·1 |
| VI. Tincture of Iodine and Alcohol,..... | 5·3 | 76·5 | 81·8 |
| Totals, | 171·9 | 307·3 | |

ABSTRACT OF THE TABLES IN NOVEMBER No.

| NAME OF SUBSTANCE. | Reaction of Simple Solution. | Days and reaction when Animalcules appeared in | | | Average Antiputrefactive power. | Days and reaction when Fungi appeared in | | | Average Antifementative power. |
|--|------------------------------|--|--------------|-------------------------------------|---------------------------------|--|------------------|-------------------------------------|--------------------------------|
| | | Beef Juice. | Egg Albumen. | Beef Juice, Urine, and Egg Albumen. | | Beef Juice. | Egg Albumen. | Beef Juice, Urine, and Egg Albumen. | |
| I. | | | | | | | | | |
| <i>Metallic Salts.</i> | | | | | | | | | |
| Mercuric Chloride, | Acid. | ... | ... | ... | | ... | ... | ... | |
| Argentio Nitrate, | Do. | ... | ... | 8 Neutral. | | ... | ... | Not determined | |
| Cupric Sulphate, | Do. | 86 Acid. | ... | ... | | 20 Pen. Acid. | ... | ... | |
| Liquor of the Perchloride of Iron (B. P.), } | Do. | 42 Neutral. | 7 Neutral. | 10 Neutral. | 19.6 | 4 Pen. do. | ... | 2 Pen. Acid. | |
| Plumbic Acetate, | Do. | 28 do. | 90 do. | 60 do. | 59.3 | 5 Pen. do. | 75 Pen. Neutral. | 11 Pen. do. | 30.3 |
| Zinc Chloride, | Do. | 4 Acid. | 18 Acid. | 10 Acid. | 10.6 | ... | ... | 5 Pen. do. | |
| Zinc Sulphate, | Do. | 30 Neutral. | 90 do. | 5 do. | 41.6 | 4 Pen. Acid. | 70 Pen. Acid. | ... | |
| Ferrous Sulphate, | Do. | 14 do. | 35 Neutral. | 4 do. | 17.6 | 5 Tor. do. | 40 Tor. Neutral. | ... | |
| II. | | | | | | | | | |
| <i>Organic Acids.</i> | | | | | | | | | |
| Benzoic, | Do. | ... | ... | ... | | ... | ... | ... | |
| Picric, | Do. | 44 Neutral. | ... | 53 Neutral. | | 11 Pen. Acid. | 44 Pen. Neutral. | 4 Pen. Acid. | 19.6 |

| NAME OF SUBSTANCE. | Reaction of Simple Solution. | Days and reaction when Animalcules appeared in | | | Average Antiputrefactive power. | Days and reaction when Fungi appeared in | | | Average Anti-fermentive power. |
|---|------------------------------|--|-------------|------------------------------------|---------------------------------|--|-----------------------|-------------------------------------|--------------------------------|
| | | Beef Juice. | Egg Albumen | Beef Juice, Urine, and Egg Albumen | | Beef Juice. | Egg Albumen. | Beef Juice, Urine, and Egg Albumen. | |
| Carbolic, | Neutral. | 12 Neutral. | 38 Neutral. | 30 Neutral. | 26.6 | 50 Tor. Neutral. | 36 Tor. do. | ... | |
| Oxalic, | Acid. | 28 do. | 40 do. | 40 Alkaline | 36 | 4 Pen. Acid. | 5 Pen. Acid. | 2 Pen. Acid. | 3.6 |
| Hydrocyanic, | Neutral. | 22 do. | 15 do. | 4 Neutral. | 13.6 | 21 Tor. Neutral. | ... | ... | |
| Citric, | Acid. | 15 do. | 10 Acid. | 11 Acid. | 11.3 | 3 Tor. Acid. | 4 Tor. Acid. | 2 Pen. Acid. | 3 |
| III. | | | | | | | | | |
| <i>Inorganic Acids.</i> | | | | | | | | | |
| Chromic, | Do. | 78 do. | ... | ... | | 38 Pen. Acid. | ... | ... | |
| Sulphuric, | Do. | ... | 30 Neutral. | 84 Neutral. | | 5 Pen. do. | 10 Tor. Acid. | 2 Pen. Acid. | 5.6 |
| Hydrochloric, | Do. | 28 Neutral. | 9 do. | 4 do. | 13.6 | 4 Pen. do. | ... | 2 Pen. do. | |
| Nitro-Hydrochloric, | Do. | 10 do. | 41 do. | 43 do. | 30.3 | 3 Pen. do. | 14 Tor. and Pen Acid. | 2 Pen. do. | 6.3 |
| Arsenious, with a trace of Hydrochloric, ...) | Do. | 2 do. | 33 do. | ... | | ... | 5 Pen. Acid. | 3 Pen. do. | |
| Sulphurous, | Do. | 24 do. | 8 do. | 4 Neutral. | 12 | 4 Pen. Acid. | ... | ... | |
| Boracic, | Neutral. | 2 do. | 10 do. | 6 do. | 6 | ... | ... | 2 Pen. Neut. | |
| Nitric, | Acid. | 18 do. | 15 do. | 11 do. | 14.6 | 4 Pen. Acid. | 5 Pen. Acid. | 2 Pen. Acid. | 3.6 |

| NAME OF SUBSTANCE. | Reaction of Simple Solution. | Days and reaction when Animalcules appeared in | | | Average Antiputrefactive power. | Days and reaction when Fungi appeared in | | | Average Antifermmentive power. |
|---|------------------------------|--|-------------|------------------------------------|---------------------------------|--|------------------|-------------------------------------|--------------------------------|
| | | Beef Juice. | Egg Albumen | Beef Juice, Urine, and Egg Albumen | | Beef Juice. | Egg Albumen. | Beef Juice, Urine, and Egg Albumen. | |
| IV. | | | | | | | | | |
| <i>Salts of the Alkaline Earths.</i> | | | | | | | | | |
| Aluminum Chloride,.... | Acid. | 19 Acid. | ... | 80 Neutral. | | 4 Pen. Acid. | 8 Pen. Acid. | 2 Pen. Acid. | 4.6 |
| Potassio-Ferric Sulphate (Iron Alum), } | Do. | 24 Neutral. | 46 Neutral. | 31 Alkaline | 33.6 | 4 Pen. Acid. | ... | 3 Pen. Acid. | |
| Chloride of Lime,..... | Alkaline | 27 Acid. | 40 do. | 35 Neutral. | 34 | 27 Tor. Acid. | ... | 24 Pen. Neutral. | |
| Sulphate of Albuminum and Potassium (Alum), | Acid. | 14 Neutral. | 38 do. | 51 do. | 34.3 | 3 Pen. Acid. | 15 Tor. Acid. | 2 Pen. Acid. | 6.6 |
| Bisulphite of Lime, | Do. | 4 do. | 9 do. | 4 do. | 5.6 | 92 Tor. Neutral. | ... | 80 Tor. Neutral. | |
| Barium Chloride, | Neutral | 1 do. | 30 do. | 2 do. | 11 | 85 Tor. Neutral. | 15 Tor. Neutral. | ... | |
| Chloralum, | Acid. | 10 do. | 9 do. | 11 do. | 10 | 3 Tor. and Pen. Acid. | ... | 2 Pen. Acid. | |
| V. | | | | | | | | | |
| <i>Organic Salts.</i> | | | | | | | | | |
| Equal parts of Quinine and Sulphuric Acid, } | Do. | 23 do. | 8 do. | 50 do. | 27 | 3 Tor. Acid. | ... | 2 Pen. do. | |
| Quinine (pure), | Neutral. | 1 do. | 4 do. | 4 do. | 3 | ... | ... | 42 Tor. Alkaline. | |

| NAME OF SUBSTANCE. | Reaction of Simple Solution. | Days and reaction when Animalcules appeared in | | | Average Antiputrefactive power. | Days and reaction when Fungi appeared in | | | Average Antifermentive power. |
|---|------------------------------|--|-------------|------------------------------------|---------------------------------|--|--------------|-------------------------------------|-------------------------------|
| | | Beef Juice. | Egg Albumen | Beef Juice, Urine, and Egg Albumen | | Beef Juice. | Egg Albumen. | Beef Juice, Urine, and Egg Albumen. | |
| Tartarized Antimony, .. | Acid. | 4 Neutral. | 43 Neutral | 5 faintly ac. | 17·3 | 2 Pen. Acid. | 9 Tor. Acid. | 82 Tor. Neutral. | 31 |
| Strychnia, with a trace of Hydrochloric Acid, | Do. | 7 do. | 15 do. | 8 Neutral. | 10 | 4 Pen. do. | ... | 4 Pen. Acid. | |
| Beberia Sulphate, | Neutral. | 4 do. | 8 do. | 7 do. | 6·3 | 2 Tor. Neutral. | ... | 5 Tor. Neutral. | |
| VI. | | | | | | | | | |
| Iodine and Alcohol. | | | | | | | | | |
| Iodine, | Do. | 1 do. | 15 do. | 1 do. | 5·6 | 80 Tor. do. | ... | ... | |
| Alcohol, | Do. | 4 do. | 10 do. | 1 do. | 5 | 4 Tor. do. | ... | 78 Pen. Neutral. | |
| VII. | | | | | | | | | |
| Salts of the Alkalies. | | | | | | | | | |
| Potassic Dichromate, ... | Acid. | 90 do. | ... | ... | | 40 Pen. Acid. | ... | 63 Tor. do. | |
| Simple Solution, | Neutral. | 1 do. | 3 Neutral. | 1 Neutral. | 1·6 | 74 Tor. Neutral. | ... | ... | |

N.B.—The blanks in the columns indicate that no putrefaction or fermentation occurred in 100 days.

The averages are calculated only where figures appear in the three columns.

These averages are obtained by dividing the sum total of the individual averages (counting 100 days to each blank space) by the number of substances in the group. The salts of the alkalis are excluded, as only one of these—potassic dichromate—was experimented with. The groups are here arranged in conformity with their antiputrefactive power—the strongest first and the weakest last. It is worthy of observation that though the figures in the antifermentive column are placed arbitrarily with reference to their group, but promiscuously as regards their power, yet when added to the corresponding figures in the antiputrefactive column, the result, *i.e.*, the total antiseptic powers, with the exception of the last figures, agrees with the method of arrangement in the first column. This is a decided indication that antiputrefactive, and not antifermentive power is the safest standard for estimating antiseptic power.

The results of the experiments prove—

1. *That Putrefaction and Fermentation are not identical processes, though apparently producing similar results.*—Putrefaction *per se* in a fluid is characterized, as already stated (*vide* putrefiers), by the presence of myriads of microzymes, putrid odour, haziness, neutral, alkaline, or faint acid reaction and slowness of change,* as compared with that produced by fermentation. Fermentation *per se* in a fluid consists in the presence of torulæ, tufts of mycelia, leptothrix filaments and other cryptogams, mouldy aroma, transparency of fluid, distinct acid reaction† and rapidity of change, as compared with that produced by putrefaction. These processes, however, though obviously different, apparently yield similar results. When consummated, the organic molecules, according to all observers, are broken down into simpler compound units: the microzymes, fetor, haziness, fungi, and mouldy aroma disappear, while the liquids hitherto responding to the tests for albumen cease to do so. Though these results, however, resemble

* I possess a quantity of beef juice prepared nine months ago, which is still quite putrid.

† Dr Dundas Thomson found that the air of three cholera wards had an acid reaction, and contained fungi without distinct evidence of the presence of vibriones; while air from a sewer was alkaline and contained vibriones.—“Air and Rain,” by Dr R. A. Smith, pp. 482.

each other, perhaps were the residual fluids submitted to fractional distillation they would yield products characteristic of the change the solutions had undergone from which they were derived.

2. *Simple Solutions of Organic Matter, when they Decompose, Putrefy in the first instance.* Vide Simple Solutions and 5. This is so well known that to mention it may seem superfluous, were it not that it also expresses its antithesis.—Simple solutions of organic matter, when they decompose, do not ferment in the first instance. The proximate cause of this is the neutral reaction of the solution.

3. *Different Organic Solutions vary in the Time of their Decomposition.*—This is well illustrated in the following table, where the number of days and of blanks occurring in the animalculæ and fungi columnus in the separate solutions are exhibited.

| Beef Juice. | | | | Beef Juice, Urine, and Egg Albumen. | | | | Egg Albumen. | | | |
|--------------|--------|--------|--------|-------------------------------------|--------|--------|--------|--------------|--------|--------|--------|
| Animalcules. | | Fungi. | | Animalcules. | | Fungi. | | Animalcules. | | Fungi. | |
| Days. | Blanks | Days. | Blanks | Days. | Blanks | Days. | Blanks | Days. | Blanks | Days. | Blanks |
| 721 | 4 | 612 | 6 | 678 | 6 | 428 | 12 | 767 | 8 | 355 | 23 |
| 1121 | | 1212 | | 1278 | | 1628 | | 1567 | | 2655 | |

Assuming each blank to represent one hundred days, the above totals are obtained, showing that while the three solutions vary in the time in which they decompose, there is yet a remarkable gradation and harmony of results. For example, the total animalculæ days in beef juice is 1121; in beef juice, urine, and egg 1278; and in egg albumen 1567. In the same order we have the total fungi days: thus, 1212, 1628, 2655; or, if the totals be read as they occur in the table, it will be seen there is almost a consecutive increment from first to last. These figures prove that beef juice is the most, and egg albumen the least, prone to change of the three solutions.

4. *Putrefaction is more difficult to prevent than Fermentation.*—This is seen in the table of approximate averages where

putrefaction is found to ensue in 172, and fermentation in 307 days. Again, in the table appended to 3, in the antiputrefactive columns there are only 18 blanks, and in the antifermentive columns 41 blanks.

5. *The majority of Neutral and faintly Acid Solutions of Organic Matter, when they Decompose, Putresfy in the first instance.*—Numerous examples in the tables prove this. In the few exceptions fermentation has immediately or soon merged into putrefaction.

6. *Neutral Mixtures remain Neutral after Putrefying.*—This statement has only one exception—pure quinine in the third fungi column is alkaline.

7. *Fermentation and Putrefaction may proceed for a short time together, but almost never originate simultaneously.*—The only exception here is alcohol, where, in the beef juice columns, it will be seen animalcules and torulæ appeared on the same day (fourth).

8. *Fermentation very frequently subsides into Putrefaction, but Putrefaction is seldom intensified into Fermentation.*—Out of 65 instances in which fermentation and putrefaction occurred in the same solution, fermentation changed into putrefaction 55 times, and putrefaction into fermentation only 10 times. In the former the change took place early, generally in from two to ten days. In the latter state, in from 50 to 90 days. In the ten instances torulæ were present only, and sparse, except in the alcohol solution, in which were penicillia only. Hence, when fungi appear in a fluid which has putrefied they are almost always torules.

9. *When Penicillia are found in a Solution of Organic Matter it is almost always Acid.*—In the 47 solutions in which penicillia occur, 42 are acid and only 5 neutral. Those in the acid solutions were greatly more exuberant than the others. This peculiarity characterizes the whole fungus tribe, its habitat being a soil of pure vegetable mould, such as decayed wood, which, according to Mulder, contains geic, humic, and ulmic acids. The juices also of fungi are acid. The boleti yielding oxalic, or, according to some, boletic acid, while other species, as the agarici, &c., contain fungic acid, some say also hydro-

cyanic acid. For some time past I have tested the reaction of a great many fungi, mucors included, by bruising them on litmus paper, and found it always reddened.

10. *Moderately Acid Solutions of Fresh Organic Matter generally first quickly Ferment and soon Putrefy.*—This is so in 50 of the 81 acid mixtures recorded. The exceptions have neither fermented nor putrefied, as mercuric chloride, benzoic acid, &c., or putrefied only, as sulphurous and hydrochloric acids, or fermented after putrefying, as tartrate of antimony and bisulphite of lime, or fermented without putrefying, as sulphuric acid, picric acid, and potassic dichromate. Hence fermentation or putrefaction may be produced at will.

11. *Most Fresh Organic Fluids rendered Acid, becoming Putrid, become Neutral.*—This law has very few exceptions—eight out of 81 instances. Zinc chloride is a prominent one, being putrid and acid at once in its three solutions.

12. *The same Acid substance in different proportions may determine Putrefaction or Fermentation.*—Though I have strong reason to believe this applies to most of the acid substances, yet only one example can be given. In the egg albumen column, Group IV., under chloralum (aqueous solution of aluminic chloride) animalcules appeared on the ninth day, and under aluminic chloride, fungi on the eighth day; the weaker solution determining putrefaction and the stronger fermentation.

13. *The Odours of Fermentation and of Putrefaction are distinct.*—Organic matter in a state of fermentation has usually an earthy or mouldy aroma, frequently not unpleasant, sometimes, indeed, slightly odoriferous. I have observed milk, after being exposed to the vapours of various volatile media, strewed with woolly and fawn coloured tufts of mucedinæ, and having a slight odour of decaying rose leaves. Moreover, as already noticed, the citric acid and beef juice solution, during its fermenting stage, gave out a faint orange perfume. The effluvia of putrefaction vary greatly, but their mildest forms are repulsive, and usually characteristic of their source. A putrescent taint is *sui generis*, and easily discriminated from the musty rotten-straw odour of fermentation.

The peculiar nauseating fetor of pus from necrosed bone is a well known instance, and is, doubtless, owing to the abundant presence of lime salts, chiefly the tribasic phosphate. When caustic lime (see putrefiers) and chloride of lime were used, the odour of their putrid mixtures at once recalled that of osseous suppuration.

14. *Almost all Antiputrefactives are Acid.*—A slight glance at the tables will show the truth of this axiom. Indeed, it may be safely asserted that marked putridity and acidity conjoined is a chemical impossibility. Much more so is “strongly acid and weakly putrid.” The converse, however, “strongly putrid and weakly acid,” is possible but transient, the mixture soon getting neutral, and, in fact, was the condition of those solutions in the tables forming the exceptions.

15. *The best Antiputrefactives are Acid.*—*Vide* mercuric dichloride, chromic acid, potassic dichromate, cupric sulphate, benzoic acid, argentic nitrate.

16. *Good Antifermentives are commonly bad Antiputrefactives, and are Neutral.*—*Vide* baric chloride, quinine (pure), beberia sulphate, iodine, alcohol.

17. *A good Antifermentive may be a fair Antiputrefactive.*—*Vide* zinc chloride, sulphurous acid, hydrocyanic acid, quinine, iodine.

18. *Bad Antifermentives are commonly good Antiputrefactives, and are Acid.*—*Vide* aluminic chloride, sulphuric, oxalic, nitro-hydrochloric, and arsenious acids, plumbic acetate, &c. To illustrate more fully the truth of this axiom, compare the figures of aluminic chloride, when it will be seen that this body has manifestly caused fermentation, as, in its absence, all its mixtures being then mere simple organic solutions, would undoubtedly have putrefied. *Vide* 2. Hence, if fermentation be an evil in a pathological sense equal to putrefaction (some think it worse), the use of this body and others of a like nature as antiseptics is either obviously useless or positively injurious.

19. *A good Antiputrefactive may be a fair Antifermentive.*—*Vide* potassic dichromate, iron alum, zinc sulphate, cupric sulphate, plumbic acetate, picric acid, &c.

20. *Fermentation may begin and end per se in an Organic Solution.*—*Vide* all mixtures figured in the fungi columns and blank in the corresponding microzyme columns.

21. *Putrefaction may begin and end per se in an Organic Solution.*—*Vide* all mixtures figured in the microzyme columns and blank in the corresponding fungi columns.

22. *The best Antiseptics are Acid.*—*Vide* mercuric dichloride, benzoic acid, chromic acid, cupric sulphate, argentic nitrate, potassic dichromate.

An antiseptic is a substance which prevents synchronously fermentation and putrefaction of organic matter. If it but does the first, it is merely an antifermentive, if only the second, it is simply an antiputrefactive. A body may seem to have a high antiseptic power in regard to preventing fungi, because it has a low antiputrefactive power in regard to preventing microzymes, as where putrefaction is strong fungi seldom appear, or only sparsely and at long intervals. The converse also obtains, though not to such an extent. A body may seem to have a high antiseptic power in regard to preventing microzymes because it has a low antifermentive power in regard to preventing fungi, as where fermentation is strong microzymes may not appear, though they generally do in abundance in comparatively short intervals.

The foregoing conclusions, be it remembered, are founded solely on the results of experiments based on clearly defined and uniform data, and while these results may be fairly relied on as regards their data, still, variations in the latter, as an increase or diminution in the quantity or quality of the organic matter, in the proportions of the chemicals used, in the temperature of the medium, or in the time allowed for the experiments would, of course, involve corresponding diversity of results—fermentation might be made to give place to putrefaction in the first instance, and *vice versa*; antiseption might be rendered strong where it is weak, weak where it is strong, or be powerfully produced by a body which in the proportions used in the tables is almost void of such action. But the conclusions, though of neces-

sity different from those of these experiments, would only differ in degree, and not in quality.

The many possible and probable sources of error attending such investigations can only be properly appreciated by those who have engaged in them. The errors in this instance cannot be many, and must have been trivial, as the observations recorded are practically repetitions of one experiment, independent of the diverse composition of the contents of the tubes. One source of error—"variation of temperature"—may, however, have somewhat vitiated the results, although all the solutions must have been uniformly affected by it. At the beginning of the experiments an attempt was made to obviate this by recording the diurnal and nocturnal temperatures of the medium in which the mixtures were kept, with a self-registering thermometer, but it had to be given up, as the results for many reasons were found practically useless. It will be seen that the maximum variation of temperature was about 11° Fah. Doubtlessly such an elevation or depression has a marked effect in accelerating or retarding decomposition of organic matter, and in this lies the erroneous element, as some of the mixtures may have chanced to be exposed for a longer or shorter time to the minimum, and some in like manner to the maximum temperature.

The sanitary worth of antiseptics may be viewed in two aspects—first, their monetary value; second, their antiseptic value. It so happens that those having the highest antiseptic power are also highest priced, while some having a moderately high power are comparatively low priced. Hence it is often cheaper and even more effective to use an excess of moderate, than limited quantities of strong antiseptics, the high price of which must frequently cause them to be employed too sparingly to be effective.*

* Since the foregoing experiments were made, an abstract of a paper in *Comptes Rendus*, by A. Rabuteau and F. Papillion, entitled "Researches on the Antiferment Properties, &c., of Silicate of Soda," has appeared in the *Chemical News*, 11th October, 1872. The authors record a series of experiments to ascertain the effect of silicate of soda upon the alcoholic, lactic, amygdalic, and ureaic fermentation. They found that it acts in the same manner as borax,

III. THE RELATIVE AERIAL ANTISEPTIC POWERS OF DIFFERENT VOLATILE BODIES AS EVINCED BY THEIR PREVENTING THE APPEARANCE OF FUNGI AND ANIMALCULES IN ORGANIC FLUIDS EXPOSED TO THEIR VAPOURS, AND BY THEIR ACTION ON VACCINE LYMPH.

Much diversity of opinion exists regarding the efficiency of the volatile antiseptics or disinfectants in preventing or arresting decomposition of, or destroying organic matter by their vapours, and more particularly in purifying an atmosphere contaminated with zymotic virus or with emanations from open sores, &c. Their antiseptic value is usually rated by the amount of their consumption, which may generally be pretty accurately measured by the extent to which they are advertised.

Few attempts have hitherto been made to ascertain relative aerial antiseptic powers. Dr R. Angus Smith has recorded a series of interesting experiments* made to test the influence of volatile substances and strong gases in preventing putrefaction. These consisted in suspending pieces of lean meat in bottles containing small quantities of the volatile substances, or filled with the stronger gases. The bottles with the volatile substances were kept under observation for fifty-one days, and those with the stronger gases for twenty-eight days—any changes in the meat apparent to the naked eye, or as regards smell occurring in these intervals, being noted.

Dr A. E. Sansom has also made some experiments,† founded on rather indefinite *data*, to compare the restrictive power of various volatile media over the appearance of

but more energetically, *i.e.*, as an antiferment, and that it is also a strong disinfectant.

Having procured some silicate of soda, and submitted it to the same tests as the substances enumerated in the tables, the result was as anticipated, *viz.*, no fermentation, and putrefaction not perceptibly delayed, but probably accelerated. It seems also absolutely destitute of disinfectant action. In the above respects silicate of soda therefore coincides with other alkaline salts. The authors are nevertheless correct in ascribing antiferment properties to this body, providing a distinction is implied between fermentation and putrefaction. *Vide* axioms 1 and 16. The same remarks apply to borax; *vide* putrefiers.

* Disinfectants and Disinfection, pp. 101-108.

† The Antiseptic System, p. 105.

fungoid organisms in flour paste and maceration of galls. With these exceptions, I am not aware of any similar investigations on record, and, as may be seen in the sequel, those about to be detailed differ in many respects from the foregoing, and are perhaps as practically exhaustive as laboratory experiments could well be.

Four drams of each of the putrescible substances (*see tables*) were put in glazed earthenware saucers about two inches in diameter and half an inch deep. These were set on a small stand six inches high, at the bottom of which was placed a breakfast tea saucer filled with the antiseptic, except in those cases specified below. The whole was then covered with a bell jar of one cubic foot capacity, its roof being six inches above the saucers containing the putrescents, and one foot above the saucer containing the antiseptic. In each experiment the chemical was placed beneath the jar twelve hours before introducing the putrescible bodies, so that purely antiseptic results might be obtained.

The nitrous acid was generated by adding six grains copper foil to nitric acid every twenty-four hours. Hydrochloric acid gas was liberated by adding sulphuric acid to the liquid acid; the temperature of the mixture rises and the gas is evolved. Carbolic acid crystals, liquified by a minimum quantity of water, were used. The sulphurous acid was generated by the ignition of four grains of sulphur under the jar every twenty-four hours. Chloride of lime, iodine, and camphor were used in their natural state. Two drams of chloroform, also of ether, were used every twenty-four hours. Antiseption was continued for six days, during which any substance found to contain microzymes or fungi was removed, and after which any substance found without either of these was exposed to ordinary air and kept under observation for twelve days, and the results noted. Strength of egg albumen, one to four of water.

| Antiseptics. | Putrescents. | Reaction. | Days when Animatecules were seen. | Reaction. | Days when Fungus were seen. | Reaction. | Days when bad odour was felt. | Remarks. |
|--------------------------------|--------------------------------------|---------------|-----------------------------------|-----------|-----------------------------|-----------|-------------------------------|--|
| Exposed to ordinary air, | Milk. | Neutral. | 4 | Acid. | 2 Pen. | Acid. | 4 sour pungent. | Coagulated on 2nd day. |
| | Beef juice. | Acid. | 1 | Do. | 1 Tor. | Do. | 1 | |
| | Urine. | Do. | 2 | Do. | ... | ... | 2 | |
| | Egg albumen. | Alkaline. | 3 | Neutral. | ... | ... | 6 | |
| | Hay solution. | Neutral. | 12 hours. | Do. | 3 Tor. | Neutral. | .. | |
| Carbolic Acid, | Mixture of equal parts of all above. | Faintly acid. | 12 hours. | Acid. | ... | ... | 12 hours. | |
| | Milk. | Neutral. | ... | ... | ... | ... | ... | Coagulated on 8th day. |
| | Beef juice. | Acid. | ... | ... | ... | ... | ... | |
| | Urine. | Do. | ... | ... | ... | ... | ... | |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| | Hay solution. | Neutral. | 2 sparse. | Neutral. | 3 Tor. | Acid. | ... | { All the substances acid on 6th day. |
| | Mixture of all above. | Faintly acid. | 2 | Acid. | ... | ... | 4 | { In 12 hours abundance of vertical bacteria. In 48 hours abundance of free life, but movements languid. |

| Antiseptics. | Putrescents. | Reaction. | Days when Animi- molecules were seen. | Reactio n. | Days when Fungi were seen. | Reaction. | Days when bad odour was felt. | REMARKS. |
|----------------------|--------------------------|---------------|---|------------|----------------------------------|-----------|-------------------------------------|----------|
| Chloroform, | Milk. | Neutral. | 5 | Acid. | 7 Pen. | Acid. | ... | |
| | Beef juice. | Acid. | 3 | Alkaline | ... | ... | 3 | |
| | Urine. | Do. | 5 | Acid. | 9 Tor. | Acid. | ... | |
| | Egg albumen. | Alkaline. | 9 | Alkaline. | ... | ... | 12 | |
| | Hay solution. | Neutral. | 5 | Neutral. | 11 Tor. | Neutral. | ... | |
| | Mixture of all above. | Faintly acid. | 3 | Do. | ... | ... | 3 | |
| | Milk. | Neutral. | ... | ... | 4 Pen. | Acid. | ... | |
| | Beef juice. | Acid. | 12 hours. | Acid. | ... | ... | 1 | |
| | Urine. | Do. | 2 | Neutral. | 7 Tor. | Neutral. | 4 | |
| | Egg albumen. | Alkaline. | 12 hours. | Alkaline | ... | ... | 2 | |
| Camphor, | Hay solution. | Neutral. | 12 hours. | Neutral. | 7 Tor. | Neutral. | ... | |
| | Mixture of all above. | Faintly acid. | 12 hours. | Do. | ... | ... | 1 | |
| Sulphuric Ether, ... | Milk. | Neutral. | ... | ... | 3 Pen. | Acid. | ... | |
| | Beef juice. | Acid. | 12 hours. | Neutral. | ... | ... | 1 | |

| Antiseptics. | Putrescents. | Reaction. | Days when Anima-les were seen. | Reaction. | Days when Fungi were seen. | Reaction. | Days when bad odour was felt. | REMARKS. |
|-----------------------|-----------------------|---------------|--------------------------------|-----------|----------------------------|-----------|-------------------------------|--|
| Sulphuric Ether, ... | Urine. | Acid. | 1 | Neutral. | ... | ... | 4 | |
| | Egg albumen. | Alkaline. | 12 hours. | Alkaline. | ... | ... | 1 | |
| | Hay solution. | Neutral. | 12 hours. | Neutral. | 7 Tor. | Neutral. | ... | |
| | Mixture of all above. | Faintly acid. | 12 hours. | Do. | ... | ... | 1 | |
| | Milk. | Neutral. | ... | ... | ... | ... | ... | |
| Iodine, | Beef juice. | Acid. | ... | ... | ... | ... | ... | |
| | Urine. | Do. | ... | ... | ... | ... | ... | |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | Gelatinized on 5th day. |
| | Hay solution. | Neutral. | ... | ... | ... | ... | ... | |
| | Mixture of all above. | Faintly acid. | ... | ... | ... | ... | ... | { All the substances acid on 2nd day. |
| Chloride of Lime, ... | Milk. | Neutral. | ... | ... | ... | ... | ... | |
| | Beef juice. | Acid. | 15 | Alkaline | 11 Gen. & Tor. | Acid. | 15 | { On 15th day has the odour of putrid urine. |

| Antiseptics. | Putrescents. | Reaction. | Days when Anima- males were seen. | Reaction. | Days when Fungi were seen. | Reaction. | Days when bad odour was felt. | REMARKS. |
|----------------------|--------------------------|---------------|--------------------------------------|-----------|-------------------------------|-----------|-------------------------------------|---|
| Chloride of Lime,... | Urine. | Acid. | ... | ... | ... | ... | ... | All the substances acid on 3rd day, and all dried up soon in consequence of the absorption of their water by the chlo- ride of lime. They were subsequently liquified with water, and set aside for the specified time. |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| | Hay solution. | Neutral. | ... | ... | ... | ... | ... | |
| | Mixture of all above. | Faintly acid. | ... | ... | ... | ... | ... | { |
| | Milk. | Neutral. | ... | ... | ... | ... | ... | |
| | Beef juice. | Acid. | ... | ... | 15 Pen. | Acid. | ... | |
| Sulphurous Acid,... | Urine. | Do. | ... | ... | ... | ... | ... | { |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| | Hay solution. | Neutral. | ... | ... | 15 Pen. | Acid. | ... | |
| | | | | | | | | All the substances acid in 24 hours. |

| Antiseptics. | Putrescents. | Reaction. | Days when Animacules were seen. | Reaction. | Days when Fungi were seen. | Reaction. | Days when bad odour was felt. | REMARKS. |
|----------------------|-----------------------|---------------|---------------------------------|-----------|------------------------------------|-----------|-------------------------------|---|
| Sulphurous Acid,... | Mixture of all above. | Faintly acid. | ... | ... | 15. A few fungus spots on surface. | Neutral. | ... | |
| | Milk. | Neutral. | ... | ... | ... | ... | ... | |
| | Beef juice. | Acid. | ... | ... | ... | ... | ... | |
| | Urine. | Do. | ... | ... | ... | ... | ... | |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| Nitrous Acid, | Hay solution. | Neutral. | 15 sparse. | Acid. | ... | ... | ... | |
| | Mixture of all above. | Faintly acid. | ... | ... | ... | ... | ... | { All the substances acid in 12 hours. |
| | Milk. | Neutral. | ... | ... | ... | ... | ... | |
| | Beef juice. | Acid. | ... | ... | ... | ... | ... | |
| | Urine. | Do. | ... | ... | ... | ... | ... | |
| Glacial Acetic Acid, | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| | Hay solution. | Neutral. | ... | ... | ... | ... | ... | |
| | Mixture of all above. | Faintly acid. | ... | ... | ... | ... | ... | { All the substances highly acid in 12 hours. |
| | | | | | | | | |
| | | | | | | | | |

| Antiseptics. | Putrescents. | Reaction. | Days when Anima- males were seen. | Reaction. | Days when Fungi were seen. | Reaction. | Days when bad odour was felt. | REMARKS. |
|--------------------|--------------------------|---------------|--------------------------------------|-----------|-------------------------------|-----------|-------------------------------------|---|
| Hydrochloric Acid, | Milk. | Neutral. | ... | ... | ... | ... | ... | { All the substances acid in 12 hours |
| | Beef juice. | Acid. | ... | ... | ... | ... | ... | |
| | Urine. | Do. | ... | ... | ... | ... | ... | |
| | Egg albumen. | Alkaline. | ... | ... | ... | ... | ... | |
| | Hay solution. | Neutral. | ... | ... | ... | ... | ... | |
| | Mixture of all above. | Faintly acid. | ... | ... | ... | ... | ... | |

The Effects of the various Volatile Media on the Physiological Properties of Vaccine Lymph.—To the separate vapours separate minims of vaccine lymph were exposed for twenty-four hours along with the putrescents. The dried spot remaining was then moistened with glycerine and water, its reaction taken, and the mixture sealed in capillary tubes till an opportunity occurred for vaccinating a child with it. All the mixture was used in one insertion, so as to make sure of obtaining its full effect.

The lymph in every instance was at first alkaline and the glycerine neutral. The following are the results:—

Carbolic Acid.

By a mistake the lymph was allowed to remain thirty-six instead of twenty-four hours under the jar. Mixture of lymph and glycerine neutral. Vaccination produced a perfect vesicle, from which I filled twelve tubes.

The lymph from two of these tubes was mixed with one minim of a 1 in 50 aqueous solution (1-50th grain) of carbolic acid. Reaction neutral. In twelve hours the mixture, now dried into a transparent film, was carefully laid past.

Chloroform.

Two of the twelve tubes used. *Vide* carbolic acid. Mixture of lymph and glycerine alkaline. Vaccination successful. Vaccination also successful with the mixture of lymph and carbolic acid, now ten days prepared. Filled ten tubes from vesicle of latter.

Camphor.

Lymph from first vesicle, *vide* chloroform, mixture of lymph and glycerine alkaline. Vaccination successful. Vaccination also successful with one of the ten tubes, *vide* mixture of carbolic acid and lymph. Filled six tubes from vesicle of latter.

Sulphuric Ether.

Two of the six tubes used, *vide* camphor, mixture of lymph and glycerine alkaline. Vaccination successful. Vaccination also successful with one of the twelve tubes, *vide* carbolic acid.

Iodine.

Two of the ten tubes used, *vide* mixture of carbolic acid and lymph; mixture of lymph and glycerine neutral. Vaccination successful. Filled eight tubes. Vaccination also successful with one of the six tubes, *vide* camphor.

Chloride of Lime.

Two of the ten tubes used, *vide* mixture of carbolic acid and lymph; mixture of lymph and glycerine acid. Vaccination unsuccessful. Vaccination successful with one of the ten tubes, *vide* mixture of carbolic acid and lymph.

Sulphurous Acid.

Two of the twelve tubes used, *vide* carbolic acid, mixture of lymph and glycerine acid. Vaccination unsuccessful. Vaccination successful with one of the eight tubes, *vide* iodine.

Nitrous Acid.

One of the twelve tubes and one of the ten tubes used, *vide* carbolic acid, also mixture of carbolic acid and lymph; mixture of lymph and glycerine acid. Vaccination unsuccessful. Vaccination successful with one of the six tubes, *vide* camphor.

Glacial Acetic Acid.

Two of the eight tubes used, *vide* iodine; mixture of lymph and glycerine acid. Vaccination unsuccessful. Vaccination successful with one of the eight tubes.

Hydrochloric Acid.

Two of the ten tubes used, *vide* mixture of carbolic acid and lymph; mixture of lymph and glycerine acid. Vaccination unsuccessful. Vaccination successful with one of the six tubes, *vide* camphor.

In consequence of the inequality in the volatile properties of the chemical substances, the results, with regard to the putrescents, though experimentally, are not entirely correct, it being obviously impossible, or, at least, extremely difficult, to obtain uniform volumes of their vapours, and also to maintain these at a fixed point of concentration for a period of

days. It was, however, attempted to approximate a standard of unity by compensating weak volatility with increase of quantity, and strong volatility with diminution of quantity, and that independent of the recognised antiseptic, disinfectant, or destructive status of each substance. For example, carbolic acid, though held by some to be the *ne plus ultra* of antiseptics, was used in large quantity, because only moderately volatile. So also were chloride of lime and iodine; glacial acetic acid I feel sure was used in excess, as from its extreme volatility and pungency a smaller portion would probably have produced the same result. Sulphurous, nitrous, and hydrochloric acids being very volatile, were employed in comparatively minute portions. The results of the experiments show that camphor and sulphuric ether in the circumstances favour putrefaction, and that the preservative power of chloroform is merely nominal. The remaining seven bodies have, however, produced effects distinctly proving them ærial antiseptics. Of these bodies, glacial acetic acid and hydrochloric acid are strongest and equal in strength. Nitric acid ranks next, in respect that microzymes were present only, and that in one instance, were sparse, and late in appearing. Chloride of lime comes next, as with it only one substance showed life, also at a late period. Next we have sulphurous acid, in which fungi appeared in three of the substances, all late. Last and weakest is carbolic acid, inasmuch as microzymes were present in two instances so early as the second day, accompanied by torulæ in the hay solution on the third day. As nearly equal quantities of chloride of lime and carbolic acid were used, these were more fairly matched than any of the others. The result is manifestly in favour of the former. As the conditions of the experiments infinitely surpassed in severity any produced by their practical application; and, seeing that withal, putrefaction and fermentation were not entirely prevented, hence aerial antisection or disinfection in the great majority of cases is fallacious.

The effects of the various volatile media on the physiological properties of vaccine lymph are strikingly conclusive,

as seen in the details of the experiments and in the following

SUMMARY OF RESULTS OF VACCINATIONS.

| SUCCESSFUL. | Reaction of Mixture of Lymph and Glycerine. | UNSUCCESSFUL. | Reaction of Mixture of Lymph and Glycerine. |
|-----------------------------|---|----------------------------|---|
| Carbolic Acid (vapour), ... | Neutral. | Chloride of Lime,..... | Acid. |
| Carbolic Acid and Lymph, | Do. | Sulphurous Acid, | Do. |
| Chloroform, | Alkaline | Nitrous Acid,..... | Do. |
| Camphor, | Do. | Glacial Acetic Acid, | Do. |
| Sulphuric Ether, | Do. | Hydrochloric Acid, | Do. |
| Iodine, | Neutral. | | |

These results coincide remarkably with those obtained by the action of the various vapours on the putrescents, iodine forming an exception, as it prevented the appearance of fungi and microzymes, but failed simultaneously to affect the lymph; so also, but conversely, chloride of lime, sulphurous acid, and nitrous acid, which partially failing in the first respect, succeeded entirely in the second. Comparing the action on lymph of the bodies on the right hand column with their action on the putrescents, and the time of their exposure, it is seen that the contagious property of the lymph is more easily destroyed by them than the growth of microzymes and fungi is prevented. These results *per se* are singularly and suggestively explicit. They show that the mixture of lymph and glycerine of the successful vaccinations was either neutral or alkaline; while that of the unsuccessful was, without exception, acid. Hence volatile acids, or a volatile body causing acidity by chemical affinity, as the chlorine from chloride of lime, which produces hydrochloric acid and free oxygen, are the best destructives of the active properties of vaccine lymph, and therefore *a priori* of variolous matter and the other zymotica.

It would be unjust to those substances in the right hand column were no allusion made to what I consider the ordinary, though some may think the extraordinary, behaviour of carbolic acid in these experiments. As already mentioned, it was allowed to act 12 hours longer on its lymph than were the other bodies, thus giving it a decided advantage over them. The experiment also was made in August, the higher temperature of which would increase its volatility; most of the other experiments were made subsequently, and at lower temperatures, yet the effect on the lymph was *nil*. Again, in order to confirm or confute this result, pure carbolic acid was, as stated, actually mechanically incorporated with lymph. This mixture may either be looked on as composed of pure lymph and carbolic acid—1 in 50, or of equal parts of lymph and water, with carbolic acid—1 in 100, —a considerable strength, it will be admitted, yet the effect was *nil*. But lest the genuineness of the vesicles produced by the two kinds of carbolized lymph should be questioned, it will be seen that their lymphs were repeatedly vaccinated “in and in” with unvarying success. So the grand card castle where resided the volatile talismanic virtues of carbolic acid has collapsed, at the conjuring touch of a mere pellicle of lymph. If a minim of vaccine matter is unaffected after being buried for 36 hours in the heart of a cubic foot of concentrated carbolic vapour, or after being mixed with the acid *per se* in the proportion of 1 in 50 for 10 days, must not the highly attenuated carbolic vapour, alone attainable in practical aerial disinfection, of necessity be powerless to cope with an atmosphere saturated and smelling with the contagium of small-pox. Moreover, it is manifest that the comparatively small quantity of the acid commonly used must in many cases fail to affect the variolous poison, though incorporated with it by the sanitarian brush in the usual manner.

These results suggest the strong probability of carbolic acid rather preserving than destroying the contagious property of vaccine lymph, and if so, I am afraid it will rather preserve than destroy the active principle of vari-

olous matter. This view, I presume, will at once be acquiesced in by those who believe in its unequalled antiseptic powers. But unless it can be shown that the acid forms a permanent harmless compound with variolous lymph or pus, which is extremely unlikely, judging from its action on vaccine lymph, I doubt if the subtle and malignant powers of small-pox poison are even temporarily suspended by it as at present used; but, if so, it is highly probable that they are released at some subsequent period, when the acid has become volatilized, as active and as virulent as at first.

In conclusion, there are several other points to which attention might be directed, but which the reader may glean from the tables. It is worth observing and comparing the large quantity of carbolic acid, and the small quantities of sulphurous and nitrous acids used, and their effects.

N.B. Since the above was in type, I have received from Dr Charles Cameron, Dublin, his Report on Public Health, 1872,* to which is appended a very able article "On the application of gases as a means of destroying contagion." In the latter some very interesting experiments are recorded. The following, with vaccine lymph and chloride of lime, confirm my own:—"Four ivory points, charged with vaccine lymph, were subjected during 24 hours to the influence of the gases evolved from one oz. bleaching powder decomposed by acid. With these points I successfully re-vaccinated two persons. The other (two) points failed. Six charged points were next exposed to the gases evolved from two oz. chloride of lime per $16\frac{1}{2}$ cubic feet, but attempts to vaccinate with these points proved unsuccessful." "If ordinary gaseous disinfection sometimes fails to destroy the vitality of vaccine, and has no effect on microzymes, we cannot rely on it as a means of destroying the contagiums of zymotic diseases, which certainly are near akin, if not to bacteria, at least to the virus of vaccine."

* By Charles Cameron, M.D., Prof. of Hygiene, Royal College of Surgeons, Analyst to the City of Dublin.

II.—ON THE RELATIONSHIP OF ABSCESS OF THE LIVER TO GASTRO-INTESTINAL ULCERATION.

By JAMES FINLAYSON, M.D., L.R.C.S.E., *Fellow of the Faculty of Physicians and Surgeons, Glasgow.*

THAT abscess of the liver is in some way related to gastro-intestinal ulceration, and more particularly to dysentery, appears to be admitted on all hands.

Indian and Algerian practitioners seem to lean to the opinion that in some cases, at least, and perhaps in many, hepatitis is the primary disorder, and dysentery the secondary.* This relationship of the two diseases can scarcely be proved by dissections, as the age of the dysenteric ulcers must almost of necessity be a matter of doubt; to rely on the absence of dysenteric symptoms during the early part of the illness has been shown to be fallacious, inasmuch as numerous dissections have revealed extensive ulcerations of the colon without any corresponding symptoms during life.

By Dr Budd,† the relationship of the two diseases was supposed to be exactly the opposite: the ulcerations of the bowel being held to give rise to absorption of pus or other morbid products into the portal system, and so to abscess of the liver. This view is more capable of being confirmed by the occurrence of hepatic symptoms, or of a recent abscess, in the course of or towards the termination of an old dysentery. This theory, although accepted by few as exclusively satisfactory, has in the main stood its ground for a certain class of cases; and indeed it seems to be accepted to a

* Annesley: *Researches into the Causes, Nature, and Treatment of the more Prevalent Diseases of India*. Quarto London, 1828. Vol. I., p. 517.

Murchison: *Diseases of the Liver*. London, 1868, p. 164.

Parkes: *Dysentery and Hepatitis of India*. London, 1846, p. 58.

Morehead: *Clinical Researches on Diseases in India*. London, 1856. Vol. II., p. 11.

Haspel: *Maladies de l'Algérie*. Paris, 1850, p. 266.

Rouis: *Recherches sur les Suppurations Endémiques du Foie*. Paris, 1860, p. 205.

The old theory of this connection was that the bile, vitiated by disease of the liver, irritated the mucous membrane of the intestine. The preference of the ulceration for the colon was ascribed to the faeces remaining longer in contact with the large intestine, and especially with its folds. This idea is now generally abandoned as quite unsatisfactory.

† Budd: *On Diseases of the Liver*. Second Edition. London, 1852. Chap. 2.

greater or less extent by all authorities. Although the idea of the concurrence of the two diseases being altogether accidental is now generally abandoned, Dr Bristowe * seeks to explain their connection by regarding both as different manifestations of the same morbid influence; he thinks that this influence (whatever it may be) gives rise in one man to dysentery, in another to hepatitis, and in a third to both. Dr Morehead† agrees with this last opinion as an explanation in part; he thinks, moreover, that the supervention of dysentery, so frequently observed in the course of hepatitis, may have been due in some cases to the use of mercurial and other powerful medicines; on the other hand, where hepatitis occurs in the course of dysentery, he regards it as a secondary inflammation arising in a predisposed organ.

In support of this statement, as to the liver being thus predisposed, the opinion of Dr Parkes may here be cited. He thinks that if functional disease is to be judged of by chemical analysis of the secretion of the liver, this organ may be said to be more or less affected in every case of dysentery, and he evidently regards the association of the two diseases as related in some way to a sympathy in the functions of the liver and of the glandular structures of the colon.‡

Dr Murchison§ has sought to simplify the subject by separating the small multiple abscesses of the liver from those of large dimensions usually met with in tropical countries, which are either single, or at least seldom exceed two or three in a given case. To the former class (whether occurring in tropical or temperate climes) he gives the name "*pyæmic*," and to such he thinks Dr Budd's theory fairly applies, as he is not aware of this variety occurring apart from previous ulceration or some allied process. The other class he names "*tropical*," and the conjunction of dysentery with such an abscess he regards as the accidental concur-

* Bristowe: *Pathological Transactions*. Vol. IX., p. 241.

† Morehead: *Op. Cit.* Vol. II., pp. 11-13.

‡ Parkes: *Op. Cit.*, p. 46, also pp. 115-118.

§ Murchison: *Op. Cit.* Lecture V.

rence of two not uncommon diseases, or as the double effect of a common cause.

The following case of hepatic abscess, which occurred to me recently, suggests in a very forcible manner a reconsideration of the question. The patient was found after death to have been affected with a single abscess of the liver; his stomach presented the evidence of an old and probably healing ulcer; the abscess, too, seemed fairly on the way towards recovery (as judged both by the clinical and the *post-mortem* evidence), but death resulted from profuse hæmorrhage into the colon—the hæmorrhage only occurring during the last three days of life, and being altogether dissociated from any ulceration of the mucous surface.

CASE.

Richard S., aet. 45, employed as a porter in a grain warehouse, came under my care on Oct. 16, 1872, having been previously a patient of Dr Ewing of Lanark. He had always lived in Ayrshire or Lanarkshire. His habits were extremely temperate. His illness began suddenly in the first week of August with pain in the region of the stomach and with vomiting. A day or two after the pain began violent shiverings occurred—lasting about half an hour—followed by sweats and exhaustion. When I saw him first the pain still persisted, the shiverings continued to recur usually every day at uncertain times; occasionally a day was missed, but very seldom two days. Sometimes two shiverings occurred in the same day. The bowels were regular and the urine revealed no abnormalities except the deposit of lithates. A physical examination made by Dr Gairdner, a few days before I saw him, revealed no organic alteration, except “a slightly enlarged state of the liver and spleen.” My examination on October 16 indicated possibly some enlargement of the left lobe of the liver, and distinct increase of dulness in the left lateral region, which was regarded as splenic; some slight degree of induration was also felt in the epigastrium. The patient was much emaciated.

In the absence of all definite local indications, except perhaps the enlargement of the spleen, the case was treated as one of remittent fever. 5 grains of Quinine and 1 drachm of Tr. Cinchon. Co. were given in syrup of orange twice a day, and fresh lemons were ordered to be made up for a drink. The man improved under this treatment; he did so to a more marked extent when, after a few days (Oct. 21), the dose of quinine was doubled. The shiverings began to be less frequent and less severe, and by-and-by they were replaced by simple febrile paroxysms with feelings of sickness. The sweatings also began to abate or even to disappear. On Oct. 28 wine and solid food were ordered, and on the 31st the two daily

doses of quinine were replaced by a single dose of 15 grains. On the morning of Nov. 1st the patient had a natural stool without medicine, although the bowels had been confined for two or three days. He had now begun to feel so much better and stronger that he was able to be up, and he looked forward to a speedy recovery. At 8 P.M. there was another stool mingled with blood, and in a quarter of an hour a profuse discharge of blood and clots, which caused him to faint for a minute or two. He was ordered brandy and 15 drops of Battley's sedative solution of opium—to be repeated if required. He passed the night well, but had another discharge of florid blood and clots next day. He was now seen by Dr Gairdner. Acetate of lead and opium were given, cold applied externally, and ice given to suck, but although no more bleeding appeared at the surface, it soon became certain that hæmorrhage was going on internally. Collapse and unconsciousness supervened, and he died on the afternoon of Nov. 4th. Much blood came from the bowels when the body was moved.

Sectio cadaveris—48 hours after death. The examination was made by Dr Joseph Coats, pathologist to the Royal Infirmary, in the presence of Dr Gemmell and myself. The body was much emaciated. The *heart* was flabby, but the valves were normal. The *lungs* were non-adherent and normal in texture. The entire *great intestine* was much distended with soft brownish clots which did not extend above the ileo-cæcal valve; the *small intestine* was normal; there was no ulceration in any part of the bowels. On the anterior wall of the *stomach*, about 3 inches from the pylorus, an ulcer was found,—slightly elongated in form and about $\frac{3}{4}$ inch in its longest diameter; the base was somewhat thin and fibrous, the margins less abrupt than in the usual progressive (or extending) ulcer so that probably healing had commenced. The serous coat of the stomach in the neighbourhood of the ulcer, but not at a point exactly corresponding with it, was adherent to the transverse colon; in the midst of this adhesion there was a small collection of pultaceous material. Tissues were also adherent in the neighbourhood of the vermiform appendix. In the *liver* there was found a large and very irregularly shaped abscess occupying both lobes nearly to their extremities; it was situated generally nearer to the inferior than the superior surface. In some parts the abscess contained creamy pus, at others a thicker pultaceous material, and in others a somewhat dense fibrous tissue. At some parts the abscess was bounded by a firm membrane, at others it immediately impinged on the liver tissue. The hepatic tissue generally was somewhat fatty, and in the neighbourhood of the abscess somewhat softened. There was no appearance of cirrhosis and the organ was about the usual size. *Spleen* considerably enlarged (about 6 or 7 inches) and rather soft but tough. *Kidneys* normal. *Brain* not examined.

Subsequent inquiries failed to discover from the friends any account of symptoms referable to the gastric ulcer. His digestion seemed quite good, and there had been no vomiting till the beginning of the illness as described. He had, apparently, been observed to be looking much older and

to be failing in vigour for several months before this illness began, but he was able for his work up till then. There was no history and no suspicion of any injury to the region of the liver. It transpired, however, that he had been conscious of something like a movable marble in the region of the stomach (probably the softened gland (?) found in the midst of the adhesion at the stomach).

I.—The existence of an ulcer of the stomach in this case of hepatic abscess is interesting, as bearing on the connection of these two affections. The relative date of the two lesions could scarcely even be guessed at; what seemed certain was that neither of them could be recent. Although it is not a common complication in cases of abscess of the liver, Dr Budd enumerates it as one of the sources of purulent infection of the portal system. Dr Murchison also mentions simple ulcer of the stomach as a cause of multiple abscess of the liver, and in communicating two cases of this kind to the Pathological Society, he says:—"So far as my experience goes, the hepatic abscesses which are formed in connection with ulceration of the mucous membrane of the stomach, intestines, gall bladder, or biliary passages, are always of this multiple or pyæmic character." *

If we suppose that in the present case the ulcer preceded and induced the suppuration in the liver, it must be remarked that the abscess was single, and did not at all resemble the multiple pyæmic form. In the absence, however, of any definite data as to the relative duration of the two lesions, no further remark need be made on this point.

II.—The question of the relationship of the affection of the colon to the hepatic abscess in this case could not fail to be raised; and on reporting the result of the inspection to Dr Gairdner, he suggested a study of the question with the view of determining whether it could shed any light on the occurrence of dysentery in connection with hepatitis.

In the absence of all other signs of disease, with the exception of the old and inactive ulcer of the stomach, and of some slight enlargement of the spleen, it would be

* *Pathological Transactions.* Vol. XVII., pp. 145-147.

unreasonable to doubt that the hæmorrhagic oozing from the colon was due in this case to the diseased state of the liver. But if this be true, how is it that such an occurrence is so rare? In searching the records and analyses of several hundreds of fatal cases of hepatic abscess, it is difficult to find* any such case as the occurrence of hæmorrhage from the bowel apart from ulceration. This may be due either to the absolute frequency of dysentery as a complication, or to the presence of dysenteric ulcerations masking the evidence of a hæmorrhagic tendency. That several cases have presented this feature of hæmorrhagic oozing from the unbroken surface of the intestine, in addition to any bleeding connected with the ulcerations, is extremely probable. Mr Waring† gives references to ten cases, in which the stools were especially characterised as containing "coagula of blood, or grumous blood," but in all of these a breach of surface was found. In case 84 of his book the patient passed more than a pint of coagulated blood shortly before death, and the colon, in addition to "several patches of ulceration," is described as presenting *throughout* a reddish tinge. The bleeding therefore depended very possibly in part, at least, on a general oozing. Dr Morehead (Case 306) records the death of a patient with abscess of the liver as being due to dysentery, "clearly secondary." After three weeks of hospital treatment, dysenteric symptoms began, and while ten or fifteen circular ulcers were found in the *rectum only*, the mucous membrane of the transverse and descending colon was found to present some degree of vascularity. Cases, however, presenting distinct ulcerations of the mucous membrane afford a very uncertain means of estimating the tendency to hæmorrhage from congestion, apart from such

† Dr Morehead: *Op. Cit.* Case 270 comes near this. There were coagula in the intestinal discharges during life: the mucous membrane of the rectum and ascending colon was thickened and covered with granular lymph, but there was no ulceration anywhere. There were, however, coagula of blood in one of the abscesses also, and the intestine was adherent to the under surface of the liver, and although no communication between the abscesses and the intestine could be traced, the source of bleeding was left in doubt.

‡ E. J. Waring: *Inquiry into the Statistics and Pathology of some points connected with Abscess of the Liver.* Trevandrum, 1854, p. 156.

ulceration, so that this branch of the inquiry need not be pushed.*

But reverting to the case just cited from Dr Morehead's experience, it can scarcely be doubted that if the patient had lived somewhat longer, the dysenteric lesion would not have been limited to the mere extremity of the colon, and in the congested state of the transverse and descending portions we seem to see a fitting preparation for further ulcerations. It may, however, be asked what evidence do we possess (1) that abscess of the liver tends to produce congestion of the colon, and (2) that such congestion tends to produce ulceration.

In the case which forms the basis of the present paper we seem to have satisfactory evidence that abscess of the liver *may* produce, or be associated with, a congestion of the colon so great as to give rise to a fatal hæmorrhage, but in the absence of similar cases uncomplicated with dysentery, it may be useful to inquire into the behaviour of cirrhosis in this respect. In all probability the mechanism† of abscess of the liver in causing hæmorrhage is similar to that of cirrhosis, and unless we find that the colon is implicated in the hæmorrhages of cirrhosis in a more special manner than the small intestine, we need not expect to find in this direction any light on the causation of dysentery, inasmuch as dysenteric ulcerations have notoriously a special proclivity for the large intestine. On this point Frerichs‡ informs us that in cirrhosis "the obstructed circulation manifests itself in the gastro-intestinal mucous membrane by hyperæmia and abnormal secretion—results which are

* It is very suggestive, however, to find that Dr Parkes, in describing the character of the stools in dysentery, lays much stress on the presence of blood in those cases complicated with hepatitis, in which the abscess of the liver was supposed to be primary. The following is from his description of the stools in dysentery with various complications:—

"8. With Primary Universal Hepatic Abscess.—Often nearly pure blood with a little mucus and slime.

"9. With Primary Partial Hepatic Abscess.—Always much blood," &c. *Op. Cit.*, p. 52. That he regards this as being so certain as to be of diagnostic value, see remarks, p. 63.

† Namely, through its influence on the portal vein. Haspel gives two cases where compression of this vein was obvious. *Op. Cit.*, pp. 207 and 220.

‡ Frerichs : *Diseases of the Liver*. Transl. London, 1861. Vol. II., p. 45.

particularly obvious in the stomach and large intestine, but are rarely noticed in the small intestine." Thus, while in 13 out of 36 cases, the large bowel was found to have its mucous membrane softened and of a livid hue, "the small intestine was rarely implicated, and never more than slightly." We may, therefore, conclude that we are entitled to regard the fatal hæmorrhage from the *colon alone*, which was observed in my case, as following the usual law of obstructed portal circulation, and not as being determined to that portion of the intestinal canal by some mere accident or chance.*

But if there be any similarity between abscess of the liver and cirrhosis with regard to the production of intestinal hæmorrhage it may be asked what of the other evidences of portal obstruction—what of Hæmatemesis and Ascites?

From the records of cases, it seems abundantly plain that whatever tendency there may be for abscess of the liver to cause congestion of the mucous membrane, it is rare to find this so excessive as to give rise to violent hæmorrhage. If this be true for the bowel, we need not be surprised if it be true for the stomach also. If mere congestions, erosions, &c., of the stomach could be relied on, ample evidence might no doubt be adduced from the cases recorded by Andral, and those analysed by Waring, but as the latter writer observes, we must consider whether these "were not produced by the powerful and irritating drugs, especially mercurials and purgatives, which it was the routine practice to administer with no unsparing hand whenever hepatic disease was suspected to exist."†

But apart from all such doubtful appearances, it is proper to cite the case of a large hepatic abscess communicated by Dr Bentley,‡ in which vomiting of blood is noted as one of the symptoms occurring some months before death took place.

With regard to ascites, it should be remembered that

* Mouret in his Thesis (Paris, 1851) seems to have attributed the dysenteric affection to a congestion of the portal system generally. I have not seen this Thesis, but Rouis, when referring to it asks if this be so, why are there no morbid phenomena in the ileum and jejunum? Op. Cit., p. 221.

† Waring, Op. Cit., p. 140.

‡ Pathological Transactions. Vol. II., p. 70.

even in cirrhosis it is one of the late phenomena, and it is further open to consideration whether the very frequent presence of dysentery may not in part prevent or diminish any tendency to ascites. However this may be, it is instructive to find that of the five cases observed by Morehead, in which cirrhosis and abscess existed together, dysenteric symptoms and ulcerations existed in all, but ascites is mentioned in none, and was apparently absent in the whole five.*

But as an indication that ascites may follow hepatic abscess we can cite Case 90 of Mr Annesley's work. This was a case of abscess free from any suspicion of cirrhosis as the liver was described as large and flaccid; but dropsy of the peritoneum supervened as a prominent symptom so urgent indeed as to call for tapping; in this case the ulcerations of the bowel are described as slight. Haspel likewise contributes two cases in which ascites was a marked phenomenon, and two observations by Rouis, although more doubtful, should also be considered in this respect.†

It would thus seem from a comparison of the clinical features of abscess and cirrhosis that there is this point in common—a tendency to congestion of the lower bowel;‡ and that hæmatemesis and ascites, although certainly uncommon in the former, are not unknown.

Congestion of the colon being thus found to be a natural

* Morehead: Op. Cit. Cases 314–318.

† Haspel: Op. Cit., p. 207 and p. 220. Rouis: Op. Cit., Obser. 7 and 24. Dr Parkes says: "Sometimes ascites occurs probably from some degree of chronic peritonitis, or from vascularity of the omentum, or from obstruction to the portal circulation." Op. Cit., p. 69.

‡ Rouis hints at this in connection with the occurrence of dysentery, but is at a loss to account for the large bowel being specially involved. Op. Cit. p. 221. Again, 'La production des accidents intestinaux semble donc se rattacher à ce que, sous l'influence du mouvement fluxionnaire inhérent à la formation ou à la marche des abcès, la bile est versée en quantité trop grande dans les portions extrêmes du tube digestif lesquelles d'ailleurs, se trouvant déjà congestionnées et irritées par la gêne qu'éprouve leur circulation veineuse doivent être d'autant moins aptes à supporter l'impression de ce fluide.' Op. Cit. p. 224.

Dr Wood also in his *Practice of Physic*, 3rd Ed., 1852, Vol. II, pp. 478–479, in connection with this subject, speaks of the liver and bowels as being so intimately related in their circulation that "it would seem scarcely possible that one should be extensively diseased without interfering in some degree with the functions of the other, if not with its organisation."

complication of abscess of the liver,—How does this bear on dysentery? May the congestion pass on or in any way give rise to ulceration? Here again it may be useful to consider the case of cirrhosis. Frerichs, speaking of cirrhosis, says: “In many cases the exalted pressure of the blood leads to rupture of the vessels and hæmorrhage, which usually takes place from the mucous surface: more rarely the blood is infiltrated into the tissues of the bowel and produces erosions which end in the formation of ulcers.”* Dr Murchison,† also, under this head speaks of “the congested mucous membrane being excited to inflammation by causes which would otherwise be inert.” Dr Parkes‡ calls attention to an enlargement or hypertrophy of the solitary glands of the colon as one of the *post-mortem* appearances in cirrhosis,—a state, according to him, which precedes and determines the formation of ulcers in hepatic dysentery.

Reverting now to the case of hepatic abscess, we may inquire whether we can trace any gradation between a state of simple congestion such as resulted in the fatal hæmorrhage already detailed, and the condition of sloughing of large patches of the mucous membrane and the other appearances in the bowel which are observed in many of the fatal cases of hepatitis complicated with dysentery.

* Frerichs: *Op. Cit.* Vol. II, p. 45. In another passage of the work referring to chronic atrophy of the liver, Frerichs speaks of the association of this atrophy with ulcerative processes in the intestine as being not uncommon. The whole passage is here given, as it suggests an analogy between abscess of the liver and cirrhosis of a different nature from the one submitted in this paper. “In the last three cases (and I could add others of a similar nature) the atrophy of the liver made its appearance along with chronic exudation processes and ulcerations of the small and large intestine. These two affections apparently arose from a common origin: although it was not altogether clear what was its nature. There was no chronic peritonitis involving Glisson’s capsule. It appears to me that in these cases there is a similar sort of connection between the hepatic affection and the intestinal disease as exists in some of the hepatic abscesses which in tropical countries are observed to follow an attack of dysentery. The connecting link is the portal vein, which, according to the nature and manner in which its roots participate in the exudation-processes in the tissue of the intestinal mucous membrane, in one case gives rise to the so-called metastatic abscesses, and in another, produces occlusion of the capillaries and consequent atrophy of the liver.” Vol. i, p. 267.

† Murchison: *Op. Cit.*, p. 249.

‡ Parkes: *Op. Cit.*, pp. 115-116. Although I cannot find any definite reference to this enlargement of the glands in Frerichs’ work, it is mentioned in some of the *post-mortem* records he gives. See Vol. II., Cases 7 and 13.

Dr Morehead gives an account of an abscess in the right lobe of the liver in Case 261 of his book already quoted: no ulcerations existed in the bowel, but “the mucous membrane of the large intestine was dark red and dark grey in parts.” In Case 302 he reports two abscesses in the liver which were supposed to be caused by fist blows—the illness was complicated with diarrhoea—“the large intestine was laid open, the mucous surface was discoloured red, but no ulceration was detected anywhere.” In Case 98 of his work Mr Annesley reports an abscess following a long illness from subacute hepatitis; dysenteric symptoms occurred late in the illness, and the mucous membrane of the large intestine was found inflamed but not ulcerated. In a case already alluded to in this paper (Dr Morehead—Case 306), in addition to the congested state of a large part of the colon a few ulcerations were found, limited, however, to the rectum alone.

We thus have illustrations of several gradations in the intestinal lesion:—Congestion of the colon, pure and simple; congestion with diarrhoea; inflammation with dysenteric symptoms; congestion in a large part of the colon and ulceration in the rectum where this process usually begins.* It is, therefore, probable that the congested state of the mucous membrane in this disease predisposes it to ulceration from causes which might otherwise be inert. But it is notorious that hepatic abscess chiefly occurs in countries where influences potent for the production of dysentery are extremely rife, so that any slight proclivity in this direction may be expected to determine the occurrence of this complication. The presence, moreover, of an inflammatory disease in the largest organ of the abdomen, coupled with the severe hectic fever usually associated with suppuration,

* Haspel thus summarises his experience: “Nous dirons seulement en passant, que toutes les nuances d’injection indiquées par les auteurs dans la muqueuse du gros intestin se sont présentées à nous, depuis la simple rougeur jusqu’à la coloration noire la plus foncée: depuis le simple ramollissement, la congestion, l’épaississement œdémateux et squirrheux des trois tuniques intestinales jusqu’à l’ulcération, la destruction de toute épaisseur des parois intestinales, la perforation et la gangrène.” Op. Cit., p. 245.

should also be remembered.* This may assist in determining a lesion in the congested bowel more readily than if the obstructive disease had nothing of this character.

In advancing the foregoing suggestions, it is not intended to offer any universal theory of the occurrence of dysentery in connection with hepatitis. There can be little doubt that several circumstances and conditions unite in bringing about this frequent conjunction. The mere accidental concurrence of two not uncommon disorders may account for a fraction of the cases; the two diseases may in some instances have a common cause; the production of abscesses in the liver from previous ulceration and suppuration in organs connected with the portal system can scarcely be doubted, nor can we ignore the influence of violent purgatives so freely resorted to in the treatment of hepatitis, and recorded in many of the cases proving fatal with dysenteric symptoms. The suggestions in this paper apply, of course, only to such cases as may be supposed to have begun with the disorder of the liver, and where the dysentery was either truly secondary, or originally of subordinate importance. If the theory serves to explain the etiology of a few of these cases it is the most that can be claimed for it.

The propositions in this paper—although separately established on what seems good authority—may appear to hang together by a connection of too theoretical a character, but in the nature of things this is almost inevitable. The case which forms the basis of this communication, although, no doubt, exceptional, is obviously one of much importance, whatever view may be taken of it; the details of it, along with the foregoing remarks, are submitted for the consideration and decision of those who have more frequent opportunity of seeing both diseases in their complicated and uncomplicated forms.

* Dr. Morehead says:—The result of my observation of phthisis in India leads me to believe that in the majority of cases in that country, the ulceration of the large intestine does not differ in character from that frequently observed in dysentery. *Op. Cit.*, Vol. II., p. 12.

III.—NOTES OF FIVE WEEKS' SURGERY IN THE ROYAL INFIRMARY, WITH REMARKS ON ANTISEPTIC TREATMENT.

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(Read before the Glasgow Medico-Chirurgical Society, 17th Jan., 1873.)

MR PRESIDENT AND GENTLEMEN, — In the absence of any member of the regular surgical staff of the Royal Infirmary, it becomes the pleasing duty of one or other of the dispensary surgeons to take charge of his wards. In accordance with rule, I was requested by our worthy Superintendent to look after the welfare of the patients in wards 21, 29, and 30 during my friend Dr Dewar's sojourn in the Highlands. The three wards are situated on the top storey of the new Surgical Hospital, are all well ventilated, and thoroughly clean. Ward 21 is the chronic male ward, and contains 19 beds; ward 29 is the male accident ward, which, along with two side rooms, gives accommodation to 17 patients; while 30 is reserved for females and children, and admits 15 patients,—in all, 51 beds. With your permission, we shall take the patients in the female ward first in order.

CASE I.—Mrs M.C., aged 27 years, of a robust constitution, and five months pregnant, was admitted at 11 P.M., on the night of Saturday, 14th September, 1872. A short time previously, while standing at the Cross, she was knocked down by an omnibus, one or more wheels of which passed over her legs. A large lacerated and contused wound occupies the front and inner aspect of left lower limb from knee to ankle, while here and there fragments of bone are protruding, the wheel having apparently passed along the limb, not across it; the right leg, again, about its middle third, and to that extent, is found to be flattened like a cake, and yields, to the touch, a sensation as if the bones were crushed into small fragments like egg shells. There is a lacerated wound of about two inches in extent on the outer aspect of the injured part; the arteries in both limbs are entire. The

poor woman suffers comparatively little shock, and stoutly persists in refusing to submit to amputation of either limb. She was ordered 6 oz. brandy in the 24 hours, and the fractures were put up as carefully as possible. She steadily refused to submit to operation until the 20th Sept., when she begged to have one or both legs taken off, if we could save her life. Her pulse was now 130, and the left lower extremity, from knee to ankle, was in a sad state from inflammation and sloughing of the tissues. On asking the only two of the surgeons in the house at the time to see patient, one said, "Do not interfere, or you will get the credit of killing the patient," the other gave permission to operate, but without any hope of recovery. At the patient's urgent solicitation, the left limb was taken off at the middle third of the thigh. The tibia was found broken into nine fragments, while the fibula remained entire!

The other limb was put up in a Macintyre splint, from which a piece had been cut opposite the wound, so that the dressing could be changed without moving the fracture. A drainage tube of green silk led from the wound through a hole in the dressing to a cup placed beneath. Perfect consolidation took place. The pulse remained for ten days at 120, and gradually fell to the normal state. The stump healed very well.

CASE II.—Mrs M., aged 50 years, suffering from strangulated femoral hernia in left groin, was admitted on the 23rd September, 1872. Patient states that the swelling first made its appearance two years ago, when lifting a heavy weight, since which period she has been troubled with it less or more. During an attack of vomiting, three days ago, the bowel came down, but she did not think about it, but applied mustard poultices and hot fomentations to relieve the abdominal pain. In the end she had to send for a medical man, who ordered her to the Infirmary. She was put under chloroform, when the taxis was tried, which failing, I operated under the carbolic acid spray. On opening the sac, a knuckle of intestine, of a maroon colour, was found, but no omentum; the stricture was divided, the

bowel returned, and the wound dressed antiseptically. She was put to bed, and ordered to have ice or soda water if thirsty, but no food or medicine. Seven P.M. on 24th, pulse 86; no vomiting since operation; slept last night; ordered beef tea, and the wound was dressed every fourth or fifth day, and kept perfectly antiseptic all through. The pulse never rose above 86, and neither medicine nor stimulant was required. The bowels were not opened until the eighth day after the operation. She was sitting at the ward fire on the 13th October. In this case the sac was dissected from its surrounding attachments, stitched through its neck with carbolized catgut, and cut off close up to the crural ring, in the hope that the cicatrix may prevent the return of the protrusion.

CASE III.—M. E., aged 12 years, admitted 23rd September, 1872. On examination, patient is found to be suffering from a firm, elastic, smooth tumour, about the size and shape of the head of an eight months' child, apparently springing from the head of right fibula. A number of blue veins are observed meandering over its surface. The girl states that about five months ago, she felt a severe pain below right knee, when a small swelling appeared, which has gradually and rapidly increased until her admission to hospital. A consultation was called, when the tumour was pronounced to be osteoid cancer, and amputation above the knee-joint recommended. On the 26th September, the amputation was performed above the knee, and the stump dressed antiseptically. Four weeks after, the wound was all but perfectly healed. The tumour, on being sawn through, was found to present a beautiful example of osteoid cancer, with spicula of bone running through it, resembling the arbor vitæ structure of the cerebellum.

CASE IV.—J. L., aged 6 years, a strumous boy, who has been ailing for two years. At present he is found to be suffering from an abscess in left groin, also from a small open sore over left os calcis, which leads down to a cavity in the bone. The lad was ordered to have cod-liver oil and muriated tincture of iron. On the 24th Sept., the foot was

removed by Syme's method, and the sharp flap carefully mopped with solution of chloride of zinc, and then dressed antiseptically. The case did well. Disease of the os calcis alone appears to me to be an indication of a much deeper constitutional taint than general disease of the tarsal bones. Excision of the bone might have been performed here, but the child was greatly emaciated, and as the after treatment of the excision entails an extremely long confinement to bed, amputation was deemed preferable. Indeed, the propriety of the cutting-out operation, in any case of disease of the heel bone may, I think, be open to question. Patients on whom excision has been performed, as a rule, die early of phthisis, a consummation which a prolonged residence in hospital will not tend to obviate. Moreover, were life spared for a more lengthened period, amputation at the ankle joint would leave a limb probably in every way as useful as the foot with the arch destroyed.

CASE V.—J. J., aged 9 years, admitted on 25th September, 1872. Patient has suffered from pain and swelling in right knee for the last four years. At times better when she gave it rest, at times worse when she took much exercise; latterly she has been confined to bed altogether. The knee is bent at a right angle. Amputation was performed on the 27th above the knee, and the case progressed satisfactorily to a cure.

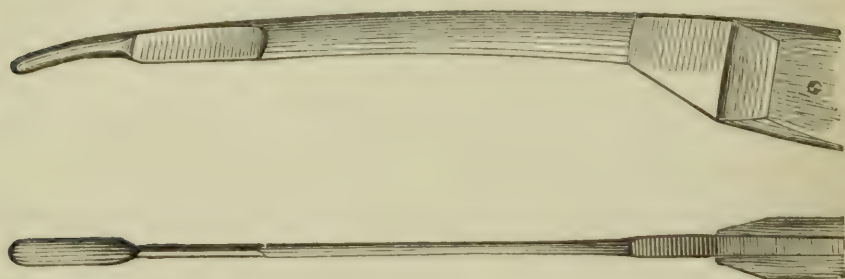
WARD 29—CASE VI.—D. M., aged 22 years, admitted on Friday, the 20th September, 1872. To-day, while at work in a ship-yard, a log of wood fell on his left leg, causing a compound dislocation of the ankle joint. Both bones of the leg protruded outwards—the internal malleolus broken off, and remaining attached to the internal lateral ligament, the foot having its sole turned towards the opposite limb. Mr Buchanan, house surgeon, carefully, but slightly, enlarged the skin wound, flexed the thigh on the pelvis and the leg on the thigh, and easily returned the bones and foot into proper position. The strongest watery solution of carbolic acid (1 to 20) was thrown into the joint plentifully; the foot and half way up the leg carefully dressed with eight-

fold gauze, next the wound, and the splint applied. 21st September.—Next day, the dressing was changed under carbolic acid spray, when a large clot was found filling the ragged wound, and from which a considerable quantity of bloody serum had escaped. The protective green silk was now applied next the wound, (it is not necessary at the first dressing in such a case, or in any case where a profuse discharge may reasonably be expected), gauze was placed over it as before, the limb carefully bandaged with a Scultetus, and placed in a well-padded Macintyre splint. The wound was dressed every third, fourth, or fifth day, as we deemed necessary from the apparent amount of discharge. This man gained, we calculated, more than a stone in weight during his residence in hospital, which he left with a joint perfect in shape and motion.

CASE VII.—T. S., aged 34 years, admitted 20th September, 1872, with compound fracture of both bones of right leg in the middle third, caused by the limb being jammed between two casks of porter. Injected with 1 to 20 carbolic solution, dressed with gauze, Scultetus, and straight side splints. Changed next day, when firm clot is found in wound, and allowed to remain, protective being placed over it, and the gauze as before. 25th.—Dressed again under spray. 29th.—Changed as before. Oct. 5.—Again, and afterwards once a-week. This man's pulse never rose above 80; he did not lose one hour's sleep or one regular meal, and of course no stimulants were required.

CASE VIII.—J. M., aged 31 years, admitted 7th October, 1872. Patient has suffered from rupture for some months back. Two days ago the bowel came down, since which time it could not be returned. He now labours under strangulated oblique inguinal hernia on the right side. Patient vomits, as he says—"What should go the other way;"—complains of pain radiating from the umbilicus—while the tumour itself is tender, with slight redness over its neck, probably from the application of the taxis outside. M. was put under chloroform, and the operation performed under the carbolic spray. Bowel, to the extent of two feet, was found in the sac, and the stricture was

formed by the external ring, a situation at which it is rarely met with in a patient so young—while in old persons and old ruptures it is the common seat of stricture. 8th.—Dressed, looking well, only there was œdema of scrotum which was elevated. 11th.—Changed to-day. Œdema nearly gone. 13th. Dressed; œdema gone. 18th.—Wound quite healed; sutures removed. Dismissed on the 26th October. This was my 34th operation for strangulated hernia, and at it, as in the five cases immediately preceding, I used the knife which you see



here; it differs from Sir Astley Cooper's, simply in the blunt pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. In femoral hernia especially, the stricture is much more easily cut than with the ordinary knife. I have opened the sac in all the cases in which I have been called upon to operate, as being the safest mode for the patient. Although the stricture is usually external to the sac, yet the neck of the sac itself may form the stricture, adventitious bands may remain inside, and, as length of time is not an absolute criterion as to the state of the contents of the sac, but rather the tightness with which the bowel has been caught, you cannot, with certainty, tell when to open the sac, and when to leave it unopened. I have seen the gut safe after a week's strangulation, and in other cases black in a number of hours, the latter especially in femoral ruptures. Besides, after all, it is not the operation which kills the patient, but the delay which has taken place before you see the case. The proper way to act when called to a case of strangulated hernia is,

I apprehend, to explain the nature of the case to your patient, put him or her under chloroform, try the taxis, and failing reduction, be prepared to operate at once. If you have a blush on the skin over the tumour, omit the taxis, and operate immediately, if the patient's strength will admit. It is, in my humble opinion, great folly to waste precious time in administering purgatives and injections, and waiting for their action. The only cases in which delay is at all admissible, are the large, old herniæ, in men advanced in years, in whom the circulation is slow, the stricture at the external ring, and the strangulation rarely very tight, and consequently where there is less risk of gangrene. In such cases, large injections, thrown up, so as to distend the lower bowel, and be ejected immediately, with the application of ice to the tumour, afford a fair prospect of success.

CASE IX.—R. L., aged 19 years, admitted on 25th September, 1872. To-day, while assisting at hoisting a pipe weighing two tons, the crane broke, he was knocked down, and sustained a severe compound comminuted fracture of left leg, which was amputated below the knee. The case progressed, and ended well.

WARD 21. CASE X.—A. M., aged 11 years. Patient has been in hospital for some time, suffering from strumous disease of knee-joint and of foot of same limb. On the 20th September, amputation through the lower third of femur was performed, and the lad was dismissed perfectly well on the 18th October.

CASE XI.—M. M.L., aged 20 years, admitted on September 5th, 1872. Patient has been suffering from disease of the left elbow-joint during the past twelve months. Excision was performed on the 20th September, and the wound dressed in the usual manner. For some weeks the case progressed fairly, but phthisis began to show itself, and some time afterwards Dr Dewar was compelled to amputate the arm.

CASE XII.—J. B., aged 18 years, admitted on September 30th, 1872. Patient has been labouring under disease of left wrist-joint for the last fifteen months, without any

assignable cause for its origin. At present there are three openings on the dorsal aspect of wrist, all leading down to diseased bone. On the 11th October the wrist-joint was excised, according to Butcher's method, which consists in raising a flap from the dorsal aspect of the joint, cutting the extensor tendons, except those of the thumb, removing the carpal bones, and sawing off the ends of the radius and ulna. The cartilages should also be taken off the ends of the metacarpal bones. The wound is allowed to heal with the fingers in a semi-flexed state, while the thumb remains as a moveable opponent to the fingers in their fixed position. The lad left the hospital with the wound nearly healed.

CASE XIII.—W. D., aged 22 years. September, 1872. Patient states that about twelve months ago, while wrestling with one of his companions, he had one of his testicles (the left) severely bruised, but took little notice of the matter at the time of accident. Some time after, the testicle swelled, when a surgeon to whom he applied leeches the part, with a beneficial result, but pain, less or more, still remained, with some swelling. In the month of April last, the pain assumed a throbbing character, when poultices were applied, followed by the bursting of the tumour. It has continued to discharge, while the pain at the upper part of the swelling is still great, at times extreme. At present the scrotum on left side is about the size of the fist, smooth, oblong, and fluctuating in front; behind, the surface is rather irregular, tender to the touch, and having on its outer aspect a small irregular opening, surrounded by a fungating border. A probe introduced by this opening passes upwards and downwards, apparently through the body of the gland. The anterior wall was opened, permitting the escape of 4 oz. of straw-coloured serum. The pain was diminished by the tapping, but increased again as the fluid collected. On the 8th October, the gland was excised, when the testicle proper was found to have been converted into a bag or egg-shaped cyst, with a pyogenic lining. The epididymis was enlarged, and studded with small masses of tuberculous matter. Four

weeks afterwards, the right testicle was removed by Dr Dewar, on account of pain and enlargement of the epididymis; it (the epididymis) was about three times the normal size, and consisted of an encapsuled mass of cheesy tuberculous deposit.

CASE XIV.—J. D., aged 27 years, blacksmith, admitted on the 5th October, 1872. Patient complains of a severe pain in the upper third of the left tibia, which is increased during the night, so that for the past two months he could seldom get a comfortable sleep. D. dates the origin of his complaint ten years back, when he received a kick from a horse below the knee-joint. Patient was at that time confined to bed for a period of six weeks, although the wound was, as the man says, only skin deep. For the last five years the swelling has remained, with the attacks of pain coming at intervals. He has had, on different occasions, incisions made down to the bone, and tried many local remedies, besides which he had taken iodide of potassium for months, but with only temporary benefit. The upper end of the tibia, for a space of three inches, is much enlarged, and feels tender under pressure. There is no history or appearance of syphilis. The case appeared to me to be one of chronic osteitis, either with or without an abscess in the bone, and resembled closely some of the cases for which Sir Benjamin Brodie first trephined the tibia in 1827. On the 19th October, I pierced the bone to the extent of three-quarters of an inch, with a trephine of medium size. No cavity was found, but the tension having been relieved, the pain gradually became less, until it finally ceased altogether, and the man left the hospital well.

The minor cases, such as simple fractures, dislocations, strictures, fistulæ, and ulcers, of which we had the usual numbers, I have not referred to.

The antiseptic mode of treatment was faithfully carried out in all the cases, with the exception of that of Mrs M'C., where there was no hope of saving the limb by any plan of treatment. The advantages obtainable by the antiseptic plan (and by it is meant, not simply dressing with

carbolic acid, because the two modes differ widely from one another), are: (1) increased cleanliness about your patient; (2) absence of unpleasant odour; (3) increased purity of the ward atmosphere; (4) reduction of the discharge to the smallest possible amount, thus harbouring your patient's strength, and avoiding the necessity for stimulants; (5) the great saving of time. After the second dressing, when all goes on as you expect, every fourth day or weekly will suffice for changing your appliances; now the gain to a patient with a compound fracture from any plan of treatment necessitating so little motion during the cure cannot be estimated; and I believe that, when properly carried out, you will rarely or never have an ununited compound fracture, just as certainly as that you may unite all simple fractures, by proper position and perfect rest; (6) and greatest boon of all to the hospital surgeon, is the almost total immunity from erysipelas and pyæmia which the treatment affords. The preceding remarks apply solely to the antiseptic treatment of wounds, as proposed by Mr Lister, and whether you believe in the germ theory or not, you must follow out the treatment exactly as if you did, or you will inevitably fail in obtaining the results you so fondly expect. It is from non-attendance to this simple fact that the carbolic acid treatment fails in the hands of some gentlemen, and from the same cause that others have discarded it, as being no practical improvement. Every change or fancied improvement on the original plan that I have seen practised, has only tended to disappointment, and to destroy belief in the antiseptic treatment, which, when properly carried out, will, in my humble opinion, be yet found to rank second only to chloroform, as a blessing to surgery.

IV.—ON THE TREATMENT OF CHRONIC EXANTHEMAL KATARRH OF THE TYMPANUM.

By JAMES PATTERSON CASSELLS, M.D., M.R.C.S. *London, Fellow of the Faculty of Physicians and Surgeons ; Surgeon to the Glasgow Dispensary for Diseases of the Ear.*

IN a former communication to this *Journal** attention was directed to that form of katarrh of the ear in which the membrana tympani is unruptured. In the acute stage early incision of that structure was insisted upon, in order, not only to save the patient's life when endangered, but to arrest the progress of the diseased action set up in the middle ear ; while in chronic cases the same operation was advocated, in conjunction with other treatment, for the removal of unorganized deposits from that cavity.

In this paper, intended as a completion of the subject treated of in the communication referred to, it is proposed to enumerate the pathological changes that are met with in the more chronic and advanced forms of the same disease, when complicated with destruction of the membrana tympani by ulcerative absorption, and to consider some of the methods of treatment recommended for the cure of the general ear affection, which has preceded, and usually accompanies them.

In proceeding to view the pathological changes that are more commonly met with in this form of katarrh, it is not deemed necessary, or in keeping with the practical aim of this paper, to enter at length into an examination of them : in addition to the partial or complete loss of the membrana tympani already referred to, they are as follows :—

Hyperæmia and hypertrophy, with ulceration of the lining membrane of the tympanum, leading to a diminution of the elasticity of the membranes of the fenestræ, and caries or necrosis of the osseous walls of that cavity ; diminution or loss of the vibrations of the ossiculæ, either through ankylosis of their articulations, or by the deposition of calcareous

* "On the treatment of Chronic Exanthemal Katarrh of the Tympanum." Number for August, 1872.

and other morbid matters around them, restraining or completely arresting their movements; while the purulent discharge, always present in such cases, frequently occasions, not only their separation* from each other and from their attachment to the walls of the tympanum, but even their expulsion from that cavity; polypous growths springing either directly or indirectly from the tympanum, and granulations upon its lining membrane; while implication of the mastoid cells, formation of fistulous openings over the mastoid process and elsewhere, with the secondary affections of the nervous and vascular systems, even of the brain itself, though seldom observed, are among the more serious and not unfrequent consequences of this form of ear disease.

Of equal importance, and accompanying the morbid changes just enumerated, adding on the one hand to the danger they are ever ready to excite, on the other to the loathsomeness of the disease, is the secretion of muco-purulent fluid by the tympanic membrane, and its discharge from the meatus, constituting Otorrhœa. Frequently the precursor and cause, of some at least, of the morbid changes above enumerated, always their co-existant, but at no time a measure of their gravity, this discharge is allowed to run its course for years untreated, nor is relief sought, till the onward progress of the deeper seated malady, manifesting itself by the appearance of new symptoms, awakens alarm, and demands attention to the condition of the organ, and the previously neglected otorrhœa. The popular notion that an ear discharge is conducive to health, appears to be the only explanation of the patience with which this dangerous and disagreeable symptom is borne by otherwise intelligent persons, while the idea, not alone confined to the popular mind, that any measures undertaken for its cure are attended by danger, can only have arisen from the imperfect observation of those cases of chronic katarrh complicated by polypi filling up the external meatus, and by their presence mechanically obstructing the free outflow of the discharge,

* In the Toynbee collection there are fifteen examples of separation of the ossiculæ from this cause,

have thus occasioned an extension of the diseased action to the deeper seated structures, and not unfrequently the death of the patient. (Politzer.)

In the present increasing knowledge concerning aural science, it is quite unnecessary to combat these notions; yet it may not be out of place here to state, with all the force of axioms, that no ear discharge is salutary, and no danger attends its cure.*

The principles that ought to guide the surgeon in the general treatment of this chronic form of katarrh, as well as the selection of the most appropriate methods, from among the many, recommended for carrying out these principles in any special case, have, in some measure, been suggested by the foregoing observations and enumeration of pathological conditions.

Before proceeding to consider some of the various methods of treatment introduced by British and Continental surgeons, it is necessary, because of its general importance in the treatment of this form of disease, to describe the mode of inflating the tympanum devised and introduced in 1863 by Prof. Politzer, of Vienna, which, bearing his name, is known as the Politzer method of inflation. The operation consists in passing a stream of compressed air through the nasal passages and Eustachian tubes, at the moment the latter are opened in the act of deglutition by the tensor and levator palati muscles, and is performed as follows:—

The patient takes a small quantity of water into the mouth to facilitate the act of swallowing; the operator, introducing a slightly bent tube into the inferior nasal passage, gives the signal for the patient to swallow, and, in the same instant, closes the opening of the nares, by pressing the ala over the introduced tube with the forefinger and thumb of one hand, while the inflating bag is forcibly compressed by the other; the air expelled from the bag passing along the open tubes into the middle ear. If the act of deglutition and compression of the

* The epigrammatic remark by Sir Wm. Wilde, in his work on Aural Surgery, is suggestive, and worthy of remembrance in connection with what is advanced in the text, "so long as otorrhœa is present, we never can tell how, when, or where it may end, or what it may lead to."

bag have been simultaneous, the patient complains of a fulness in the ears, and a peculiar friction sound heard by the operator, usually denotes the successful performance of the operation.

If the case is uncomplicated, and the katarrhal secretion abundant, in addition to the constitutional treatment which the general condition of the patient may demand, and which it is not necessary to particularise here, the thorough local cleansing of the morbidly active lining membrane of the tympanum, perseveringly carried out, will be followed in a large number of cases by a cessation of the discharge, cicatrization of the lesion in the membrana tympani, and an improvement in the function of the organ, though almost never complete restoration of the normal hearing power. In order to carry out the local treatment indicated above, frequent Politzerising and the application of an astringent to the lining membrane of the tympanum is necessary. The latter can be accomplished in one or other of the following ways:—Inclining the head of the patient, fill the meatus of the affected ear with the astringent solution and Politzerise—or having performed this method of inflation previously, fill the meatus with the fluid as before, and making use of the tragus as a piston, the fluid in either case will pass into the throat, and be felt there. (Poltizer.) The mode of Gruber* may be used for a similar purpose. It is an adaptation of the Valsalvian method of inflation, and consists in injecting the fluid into the inferior nasal passage of the affected side, and its pressure by the patient through the Eustachian tube into the tympanum.

This latter method not only possesses no advantage over the two modes recommended by Politzer and described above, but in many cases is injurious.

If the case is complicated by a polypus or warts upon the tympanic lining membrane in conjunction with a narrowing of the external meatus, the difficulty, though great, is not insurmountable; one or more incisions in the constricted part of the meatus, and cautious dilatation afterwards, either by the Bi-valve speculum of Kramer, or a tangle or sponge tent, will suffice to overcome the constriction, while the removal of the

* Deutsche Klinik 1865, Nos. 38-39.

polypus by Wylde's snare, or the galvano-caustic battery, is easily accomplished.* The complete cure of cases with warty excrescences upon the membrane lining the middle ear is extremely difficult of attainment by the ordinary means, but when these fail, the galvano-caustic cautery, as recommended in these cases by Schwartze, may be had recourse to, and always with success.† In such cases, as well before as after the removal of the excrescences, much benefit follows the use of an absorbent powder, such as talc, (Hinton) in bringing about a healthier condition of the morbid tissues.

After the lining membrane of the middle ear assumes a healthier condition, and the discharge, as a result of the treatment, is arrested, it is very easily re-excited, especially in cases in which the great loss of substance of the membrana tympani exposes the cavity of the tympanum to external noxious influences. In order to protect the delicate membrane from such a source of irritation and recurrence of the diseased process, and at the same time to improve the hearing power, the use of the artificial membrana tympani is recommended. The simple cotton wool as introduced by Yearsley,‡ or the more elaborate instrument of Toynbee§ may be used; the former, apart from its cheapness, possesses advantages over the latter, not the least of which is the facility with which the patients learn to apply it.

When the case assumes a serious aspect, and the symptoms indicate that the more vital parts are in danger, the principles of surgery are our guide. If the mastoid cells and their bony walls are either the seat of the new inflammatory action or the receptacle of the pent up discharge, a free incision down to the bone, liberating the periosteum, always relieves the intense pain, and generally arrests the further progress of the disease. In order that this latter desirable result should follow, it is important to remember the anatomical peculiarities of the development of the mas-

* Anwendung der Galvano-Kaustik. Voltolini, S. 267, Wien 1872.

† Arch. für Ohrenheilk. B. IV. S. 7.

‡ "On a New Method of Treating Deafness," &c. *Lancet*, 1st July, 1848.

§ "On the Use of an Artificial Membrana Tympani." *Journal of the Provincial Medical and Surgical Association*, 1852.

toid cells in early and advanced life, for this consideration will determine the position of the incision.* Failing relief from this means, recourse must be had to the operation of perforation of the mastoid process, in order to give exit to the morbid products confined in the cells of that bone.†

In the selection of astringents for the treatment of this advanced form of katarrh the principle that must guide us is the avoidance of those salts which, either decomposing or being decomposed by the morbid secretion, form insoluble precipitates in the tympanum which, accumulating around the ossiculæ and upon the membranes of the fenestræ, do permanent injury to the function of the organ, or by irritating the tissues, re-excite the inflammatory action.‡

On this account, the salts of zinc (except the sulphate), lead, iron, and silver, are in most cases contra-indicated; so likewise is the alum sulphate. The latter astringent, however, demands a fuller consideration.

By far the best of the astringents for general use, irrespective of the size of the lesion in the membrana tympani, or the complications of the special case, is the zinc sulphate in solution. The insufflation of alum sulphate in powder is much used by Continental surgeons (Vontrötsch, Guye); but as it coagulates the albuminates of the secretion, and forms deposits difficult of removal, it is for this reason not to be preferred to the zinc sulphate in a simple uncomplicated case with a *large* perforation in the membrana tympani. The use of a solution of this salt has been abandoned by Continental authorities (Politzer, Vontrötsch, Chimini), on the ground that it causes a furuncular inflammation of the external meatus; but Hinton, who invariably uses alum solution in the treatment of such cases, has not yet

* In early life the incision of the external meatus at its superior and posterior wall, as practised by Vontrötsch, is of the greatest value in such cases.

† This operation, demanding only anatomical knowledge for its successful performance, has achieved good results in the hands of Continental surgeons. See paper by Jacoby of Breslau in Arch. für Ohrenheilkunde, B. IV. S. 212. And no patient can be regarded as skilfully and exhaustively treated who, suffering from this complication of the disease, is allowed to die without an attempt being made to relieve him.

‡ "Ueber die Wahl der Adstringentien bei eitrigen Ohrenkatarrhen." Politzer, Wiener Mediz. Presse, 1866.

observed this peculiar effect to follow its use. Whether a solution of chrome alum, which, it is said, does not form precipitates so readily with secretions from mucous surfaces, and, when formed, they are not so insoluble as those resulting from the use of the alum sulphate, will give all the good effects of the latter salt, cannot, in the absence of experience, be accurately decided in the meantime. Such is, however, much to be desired, for in many cases of katarrrhal inflammation of the middle ear, a speedier and more permanent result is obtained from the alum preparation than from the zinc salt.

Tannin in watery solution is unreliable, but, dissolved in alcohol, as recommended by Löwenberg, of Paris,* in judiciously selected cases, it is of much service. Even the instillation of pure alcohol, is followed by good results in uncomplicated cases.—(Weber.)

The neutralisation method† of Professor Schwartz, of Halle, which consists in passing a solution of silver nitrate through the tympanum, and neutralising it by a watery solution of sodium chloride, is most effective in uncomplicated cases in which the lesion in the membrana tympani is extensive, and the exposed lining membrane of the middle ear villous and succulent looking. Moreover, its use is in most cases painless, and, notwithstanding the remarks of a recent writer on aural medicine (Allen), free from bad effects.

The insufflation of various powders, for the treatment of this as well as other forms of ear disease, has been recently advocated;‡ it is the revival of an old suggestion made by Bonnafont§ for the treatment of ulcerations of the membrane of the tympanum, and which, at the time it was introduced, received a severe criticism from the pen of a distinguished British aurist. A just appreciation of the merits of this recently re-introduced method in the treat-

* See his paper—*De la Otorreo El Pabellon Medeco*. Madrid 1870,

† *Arch. fur Ohrenheilkunde*, B. IV., S. 1.

‡ "On the Treatment of Deafness and Diseases of the Ear by the Insufflation of Pulverised Substances."—*Dr Hunt*, in *Birmingham Med. Review*, July and Oct., 1872.

§ *L'Union médicale et le Bulletin thérapeutique*, 1851.

ment of katarrhal affections of the tympanum warrants the opinion that the cases of this form of disease are not numerous in which it is advisable, and that equally good, indeed better, results can be obtained in a shorter period by the methods of treatment hitherto followed.

Want of space prevents the reports of numerous cases being appended, which, occurring in private and dispensary practice, have been successfully treated by one or other of the above methods.

V.—ON CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT.

By J. R. WOLFE, M.D., *Surgeon to the Glasgow Ophthalmic Institution ;
Lecturer on Ophthalmic Medicine and Surgery in Anderson's University.*

(*Read before the Medico-Chirurgical Society, December 6th, 1872.*)

MR PRESIDENT AND GENTLEMEN,—It was not my intention to monopolise the whole evening by reading a paper. I merely proposed to show to this meeting a successful case of conjunctival transplantation from the rabbit, and make a few remarks ; but as I have the offer of the whole sederunt I shall enter more fully into the consideration of the subject.

Like the organs which move in shut cavities, the eye is covered with a secreting membrane—conjunctiva. This membrane, after lining the parietics, *i.e.*, the posterior surface of the tarsal cartilages, makes a fold, and is continued over the anterior surface of the sclerotic, and is ultimately lost in the superficial layer of the cornea near its border.

In its *ensemble*, therefore, the conjunctiva represents a shut cavity, and was, on that account, formerly considered as a serous membrane. But it is properly a mucous membrane, covered with epithelium, and consists of three parts, which differ somewhat in structure, namely, the palpebral conjunctiva, the *cul-de-sac*, and the conjunctiva of the eyeball.

By experiments which I made upon animals, some years ago, I proved, contrary to the current opinion, that the ordinary secretion of tears for lubricating the eyeball is derived from the conjunctiva, and is not formed in larger quantity than

can be got rid of by evaporation, while the lachrymal gland, like the salivary gland to which it approaches in structure, secretes only periodically, and is intended as a reservoir to afford a large supply of fluid under the influence of irritation, when required to rid the eyeball of foreign bodies, or in cases of mental excitement.*

From its being the proper secreting membrane, it is necessary to the healthy condition of the eyeball that the conjunctiva, especially the palpebral conjunctiva, should be in a healthy condition. Any change of its structure may, by friction, endanger the transparent cornea. As an instance, I may mention the disease called trachoma, or granular lids, in which the change of structure and vitiated secretion of the palpebral conjunctiva give rise to trachomatous pannus, ulcerated cornea, and shrinking of the eyeball.

When both the conjunctiva of the eyeball and the corresponding palpebral conjunctiva are destroyed by a burn with hot metal, gunpowder explosion, quicklime, or other chemical substances, adhesion or symblepharon is the result. Iron-moulders, puddlers, and labourers in chemical works being most exposed to such accidents, hence, cases of symblepharon are numerous in Glasgow. This patient, a foundry boy from Airdrie, came to the institution two days ago for the relief of symblepharon. You see the lower eyelid fixed to the eyeball covering very nearly the whole cornea, the eyeball completely tied down, for even the levator palpebrae, instead of lifting the upper eyelid drags the eyeball and imparts to it an awkward rotatory motion. Vision is completely abolished. This case is highly unfavourable to operative interference.

To cure symblepharon is generally admitted to be exceedingly difficult, if not impossible. Numerous are the expedients which have been resorted to for the cure of that affection. They have all for their object the mechanical separation of the lid and eyeball until the raw surfaces cicatrize. Some operators try to affect this by simply dissecting

* Read at the annual meeting of the British Medical Association in Oxford, August, 1868. See also my letter to Mr Lawrence in *British Medical Journal*, October, 1868.

the adherent lid, and then tearing up the wound daily, for a certain period until it no longer united. Others, again, try to keep the surfaces separate by interposing foreign bodies, as sealing-wax, leather, glass shields, &c.

Diefenbach's method is the most ingenious. He detaches the lid from the eyeball, shaves the lashes, and then folds the eyelid upon itself, so that the skin comes in contact with the eyeball. He fixes it in this position with sutures until it heals.

After repeated trials of these methods I came to the conclusion that the proper operative method was still to be discovered.

(1.) Repeated tearing of the surfaces is useless. We always found that nature frustrated our attempt of the previous day to keep them asunder. I watched the process very carefully, and noticed that union does not take place by exudation of lymph (as taught by the Vienna School), but strictly according to Virchow's theory—viz., by proliferation of the cells, or, if I may use the expression, by parenchymatous agglutination.* There is therefore no plastic membrane to tear or tease out.

(2.) The interposition of foreign bodies must appear a vain attempt to any one who has ever tried to insert an artificial eye after dissecting an adherent eyelid. The foreign body is in such cases invariably squeezed out by gradual constriction. Indeed, I may say with regard to these and similar methods, that they are based upon the supposition that a delicate physiological action can be replaced by a coarse mechanical contrivance. Nature, which supplies the organism with lymph, synovia, mucin, and tears for smoothing the various membranes, abhors every motion upon rusty hinges or friction of surfaces. Whenever these surfaces rub upon each other they ultimately adhere.

For the last few years I have practised an operation for the radical cure of symblepharon by plastic operation of the conjunctiva. I take a portion of the neighbouring healthy conjunctiva of the eyeball, wherever I can get it, to supply the palpebral conjunctiva which has been destroyed. For experience has

* In contrasting the doctrine of Virchow with that of the Vienna School, which is still current among some medical writers, I am aware that Rokitsanski himself became at an early date an adherent to the Cellular Pathology, which he enriched with his new and valuable observations.

taught me, that loss of conjunctiva oculi, even to a very large extent, is generally regenerated without prejudice to the neighbouring tissues, whilst loss of the conjunctiva of the eyelid is followed by such disastrous results as pannus, ulcerated cornea, &c., &c., above referred to,

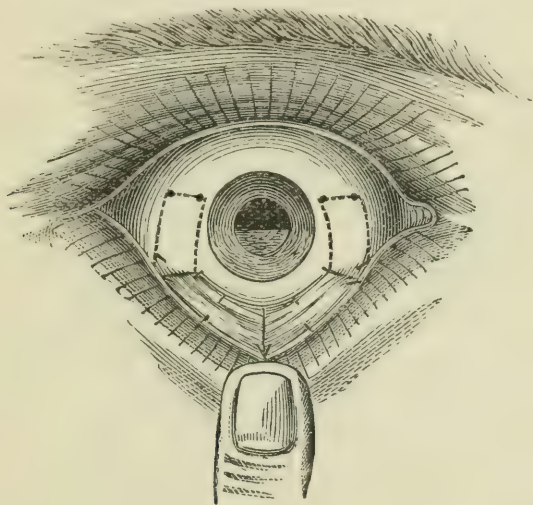


Fig. 1.

FIG. 1 represents the case of Simon M'K., aged 20, moulder, who, three years ago, had his eye burnt with molten lead, resulting in adhesions of the lower eyelid, which covered the lower half of the pupil. I dissected carefully the eyelid from the eyeball, separating it as far as the *cul-de-sac*, to make quite sure that I had liberated the eyeball completely. I then passed two fine silk threads through each side of the conjunctiva at the outer aspect, which ligatures marked the breadth of the conjunctival flap to be removed. These two I put on the stretch, and with a pair of scissors I first cut horizontally, and then on each side of the ligatures, then putting the scissors behind, I cut it from the eyeball. In cutting the flap on the stretch by means of the ligatures, I take care that the conjunctival flap is removed without any of the sub-conjunctival tissue. The same process is followed at the inner side, and these two flaps are brought together in the middle line, and secured with stitches, as marked in the diagram.

The operation was performed in September, 1869, and it will be seen that he has the free movement of the eyeball. There is scarcely any perceptible trace upon the eyeball whence the flaps were borrowed. The cornea only presents some traces of leucoma where the adhesion formerly was, and these latter are also gradually disappearing.

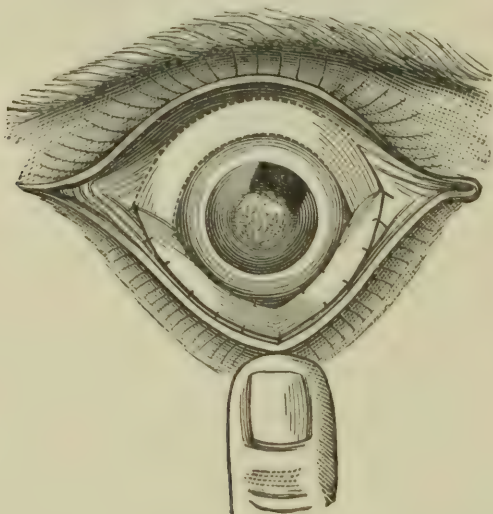


Fig. 2.

FIG 2 represents the case of John Muir, age 15, tinsmith, who burnt his eye with strong hydrochloric acid two years ago, resulting in extensive symblepharon. On presenting himself at the Institution in June last, I found the lower eyelid completely covering the upper margin of the pupil; vision was therefore impossible. The first step accordingly was to make an iridectomy upwards and inwards, and in August last we proceeded to the plastic operation of the conjunctiva.

But it will be seen that the lateral flaps were, in this case, impossible, because the burn extended above the meridian. I therefore took one large flap from the upper hemisphere of the ball, and secured it upon the eyelid as above described.

About three years ago, after I prepared a paper for the press on the subject, I became aware that Mr P. Teal, of

Leeds, published a paper on a similar operation in the Ophthalmic Hospital Report. Although Mr Teal's operation differs from my own, yet, such is my repugnance to squabbles about originality and priority, that I did not publish my paper. But having had an opportunity, in August last, to explain to the Ophthalmological Congress the nature of my operation as distinct from that of Mr Teal, I can have no hesitation in referring to it here. Mr Teal takes "a flap from each side of the conjunctiva, one is stretched across the raw surface of the eyelid, and the other is fixed across the raw surface of the eyeball—thus the two flaps are dovetailed into the wound." It is thus evident that in this operation a large supply of conjunctival tissue is requisite to repair a comparatively slight injury, while in my operation the conjunctiva of the globe is altogether disregarded; the palpebral conjunctiva alone being repaired. Besides, I take my flap from the whole breadth as far as the cul-de-sac, if necessary. The result is that, while Mr Teal interferes only with a case of symblepharon, "provided it be of moderate extent," my operation is applicable to extensive adhesions, provided there be sufficient transparent cornea to make an artificial pupil, as shown in figure 2.

This is fully borne out, not only by the drawings in Mr Teal's paper on the subject,* but also by comparing the patients which Mr Teal brought up to London to show to the Congress with those which I have the pleasure of submitting to the Society this evening.

It is right, however, to bear in mind that there is a limit to the extent to which we may go in borrowing conjunctival substance from an eye which has already been injured. If we surpass that limit, the corneal opacity is sure to extend still further, and we lose the last chance of saving vision. Indeed, we sometimes meet with cases in which the infliction of a new wound amounts to the destruction of the eye. This leads me to speak of the last case which I submit, as it is of peculiar interest:—

Ed. M^rIn., age 31, labourer in ironsmelting, Coatbridge, was

* Ophthalmic Hospital Report. Vol. iii, pp., 254.

struck by a ball of red-hot iron in the left eye on the 17th Sept., 1872, which caused the destruction of the lower conjunctiva and the greater part of the cornea. When he first came to the institution on the 24th September, seven days after the accident, the conjunctiva of the lower eyelid was completely destroyed, and the corresponding conjunctiva of the eyeball—the whole conjunctival sac was in a state of serous chemosis, and the greater part of the cornea burnt. Emollient applications were used. After a week's stay in the institution he was sent home to come back when the swelling had subsided. He returned five weeks ago. On examination, the lower eyelid was found completely covering the cornea above its upper pupillary margin, the eyeball, quite fixed by the upper and lower eyelids, and sunk in the orbit. On lifting the upper eyelid with the finger, the sclerotic was seen as it were receding, and no dragging upon the eyeball could turn the upper border of the cornea sufficiently forward and downward even for making an iridectomy. The attempt to take a conjunctival flap from the upper hemisphere of the eye, as done in the previous case, was altogether out of the question, for there was no room to manipulate either with scissors or bistouri. Indeed, it was pretty certain, considering the narrow strip of transparent cornea, that its opacity would certainly have ensued, even if section at its periphery had been practicable.

I was about to give up all idea of surgical interference, when it occurred to me, that I might give the patient some chance by supplying him with conjunctival substance from a rabbit.

I would request the gentlemen present to take a careful view of this patient. You see that both eyes are naturally too deeply set. The upper hemisphere is set too closely behind the roof of the orbit. You will notice therefore, that owing to the natural formation of the parts the portion of the cornea which escaped destruction could not be turned into account. Besides, seeing the narrow strip of transparent cornea left, to have removed a conjunctival flap from its vicinity would have resulted in rendering even it opaque.

FIG. 3 represents the eye before the operation, the upper

eyelid being raised to show the portion of the cornea which escaped the burn.*

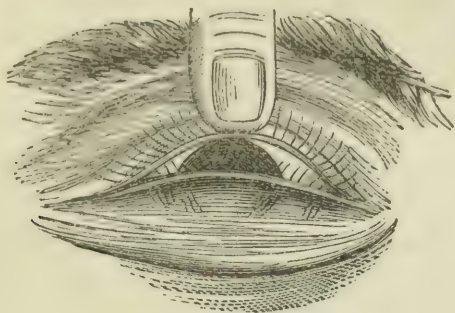


Fig. 3.

The operation was performed on the 3rd Nov., in the following manner:—Both patient and rabbit being put under chloroform, I separated the adhesions, so that the eyeball could move in every direction, and everting the lower eyelid and turning it downwards, I took from the rabbit that portion of the conjunctiva which lines the inner angle, covering the *membrana nictitans* and extends as far as the cornea, the portion to be removed having been previously defined by four fine silk threads, which enabled me at the same time to transfer it

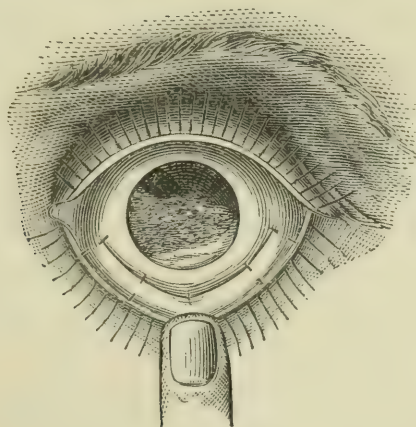


Fig. 4.

quickly to replace the lost conjunctiva palpebrae of the patient, in which place it was secured with stitches, as shown in Fig. 4.

* All these engravings were taken by Mr Stephen Miller, from the patients, in order to ensure the faithful portraying of the various parts.

I take this portion on account of its vascularity and looseness. The eye was covered with a bandage and dry lint.

Next morning, Nov. 4, the eye was found tolerably quiescent. The whole conjunctival sac was not more inflamed than was to be expected would result from the extensive dissection and from the presence of ligatures. The transplanted conjunctiva had a greyish look. Ordered warm fomentations.

Nov. 5. Complains of great pain and lachrymation, wound more tender. New conjunctiva lost its greyish appearance with the exception of isolated patches here and there, the rest is swollen and glistening, and in some parts looks not unlike exuberant granulations. Ordered warm fomentations, with *vin. opii.*, and belladonna, and strong purgatives.

Nov. 6. Swelling subdued. The grey patches decreased to two in number, and these are very small, about the size of a hemp seed.

Nov. 7. Appearance of the eye improving, irritation subdued. The new conjunctiva red and adherent. I removed the ligatures, after which the eye continued to improve. Patient remained in the hospital for a week, during which time he was carefully noted by me, assistant, and students. The eyelid remained separated through its whole extent, the eyeball movable in every direction, while the transplanted palpebral conjunctiva retained its vitality, as shown by its red appearance and comparatively smooth surface. There was only one grey spot, the size of a pin's head, visible. Was dismissed on the 11th Nov. He returned three days ago, last Tuesday, Dec. 3. The eye was found in a satisfactory condition. The conjunctiva has a healthy look, the free motion of eyeball maintained, which enabled me at once to make an artificial pupil, which is also shown in Fig. 4.

Here, then, an eye which had been rendered immoveable and totally blind by disorganization of its conjunctiva, and of the greater part of the cornea, and owing to the natural formation of the parts as well as to the extent of the loss of tissue, even the portion of cornea which escaped could not be turned to account, has, by this new procedure, been rendered a useful organ, the eye being movable in every

direction. He reads No. 16 with the new pupil made three days ago.

Our first attempt in this direction being thus encouraging, I think I am justified in saying that, if further experiments should establish the adoption of this method, we would not only possess a valuable expedient for curing an affection which has hitherto been deemed incurable, but I would consider it as an important step towards a greater surgical achievement, namely, corneal transplantation.

There is a large class of patients in blind asylums and elsewhere whose eye tissues are perfectly healthy, with the exception of corneal opacity. Now, the question is, shall we ever be able to supply them with transparent corneæ by transplantation? All attempts formerly made in that direction have failed on account of the impossibility of measuring the size of the flap. Mr Power, of St Bartholomew's Hospital, London, informed me last spring that he was engaged in corneal transplantation from the rabbit. Indeed, in August last, he exhibited to the Ophthalmological Congress a case which was so far successful that the cornea from a rabbit grew upon that of a child, but, unfortunately, it was opaque. Mr Power informed me of one case, namely, that of a soldier, in which the transplanted cornea kept its transparency for about six weeks. Now, it appears to me in experimenting with these instruments which Mr Power kindly sent me, that the occasion of its becoming opaque may be partly owing to the isolation of the corneal flap from the neighbouring tissues, for Mr Power's instrument removes a complete corneal circle. Our chance might be improved if we could make a cornea-conjunctival flap. Here is an instrument made for me by Mr Hilliard, consisting of two revolving lancets moving within a cylinder, and of two picks to fix the eyeball. The lancets cut the larger segment of a circle, leaving a corneal bridge. From this point the corneal incision is further carried on with a narrow knife, and prolonged to the conjunctiva, the conjunctival portion having previously been prepared by dissection. The conjunctival portion will not only give the cornea a point of attachment, but render

it less isolated, and improve its chance of vitality.] The first thing therefore to ascertain, was whether the conjunctiva would live. Seeing now, as this case shows, that conjunctival transplantation is feasible, we have an important point gained.

In answering, therefore, the question put above, I can only say that we are nearer to the point we are aiming at, to-day than we were yesterday.

Since the above went to press, I have had another successful case of conjunctival transplantation from the rabbit, which goes far to confirm the views expressed above, for it is not merely a repetition of the same method, but a new element has been introduced with the view of checking the result obtained on the former occasion.

Peter C., 20, Furnace Quarry, Argyleshire, received an injury upon his face and eyes from a gunpowder explosion when blasting rocks, fourteen months ago. When he first came to the Institution, four months after the accident, his face was quite riddled and discoloured by the powder. Both upper and lower eyelids of the right eye were considerably everted, and the left eye was completely closed and blinded by a symplepharon analogous to fig. 2. I made an iridectomy upwards, which resulted in a little sight when the upper eyelid was raised. On his returning this time to seek further relief, I thought it expedient to resort to our new method. I performed the operation, assisted by Mr Nairne and Mr Wm. M. Campbell, as on former occasions, on the 23rd January. The conjunctival flap from the rabbit I made larger than was requisite to supply the palpebral conjunctiva. It was fixed with stitches as before, but instead of cutting off the superfluous portion, I left it attached. In examining the case daily, in presence of the gentlemen above mentioned and our students, that loose portion indicated clearly to us, beyond any possibility of mistake, the vitality of the transplanted portion. Whilst it remained greyish, we could notice the gradual changes which the fixed portion was daily undergoing; and on February 3, nine days after the ligatures were removed, the loose

portion was still floating upon the conjunctiva a greyish flap, whilst the fixed part had almost entirely assumed a shining appearance.

During the whole course of treatment the eye was quiescent, there was neither pain nor lachrymation, and I may say that it united by agglutination. Free motion and improved vision have been established; and although this case was not so aggravated as the last, yet it may be regarded as a corroborative instance of the efficacy of the operation.

VI.—CLINICAL SURGICAL REPORT FOR THE YEAR ENDING
31ST OCTOBER, 1872.

By JAMES MORTON, M.D., *Surgeon and Lecturer on Clinical Surgery,
Glasgow Royal Infirmary.*

IN presenting the Surgical Hospital Report for the year ending 31st October, 1872, it is somewhat painful to be obliged to put on record the fact that our mortality has increased about 21 per thousand over the mortality of the preceding year, being for this year 7.3 per cent., or nearly 73 per thousand. This presents a very sad departure from that felicitous condition, which has been reached by some surgical statisticians, who are able to show a mortality rather under the general death rate of the city, in apparent oblivion of the inference that this would go to establish the desirability of having heads, legs, and arms, &c., subjected to severe mechanical violence in order to insure longevity, a kind of reasoning not calculated to inspire faith in the value of statistics.

During the year 520 cases in all were admitted and treated, and of these 38 died, and it will appear that some of the latter were hopeless when admitted.

Of *Simple Fractures* there were 73 treated in the wards, and 20 out-door. Of the former 7 died, 4 being fractures of the skull; 2 from shock due to the severity of the accidents; in one case the femur and tibia and fibula were broken, and there was a severe scalp wound; in another the femur broken with internal injuries, the last being the cause of death. A

case of simple fracture of tibia and fibula died, the fatal result being ascribed to bronchitis. A large portion of the mortality is here presented. A case of fractured ribs ranks among the simple fractures, and is interesting from the occurrence of general emphysema, and the method of treatment adopted. The customary body-bandage which was applied at first had to be removed. A sandbag was laid over the seat of fracture in front and a little below right nipple, and arrested the flapping motion of the fragments with the respiratory movements, and yet did not interfere with those movements.

Compound Fractures.—In my last report, for the year 1870-71, I was able to state that all my cases of compound fracture had recovered, and for this year a similar statement would not be far from the truth, but I have no wish to embellish or conceal. There was at least one death which we must thus classify, and as the case was somewhat peculiar, the result of the *p.m.* examination may be shortly noted. Other two such injuries were admitted, the one, admitted during my holiday, was dressed antiseptically by my *locum tenens*, and died in two days, his age was 64; the other, aged 73, was in such a condition of debility, aggravated by a compound comminuted fracture of left leg, that it was thought amputation would precipitate his death: there being no hope of recovery left, he lived four days in hospital. The number of these injuries was 18, and 15 recoveries, or, discounting the two named, 16, with one death, which death was occasioned by phlebitis, which set in four weeks after admission, affecting both legs at the same time, but most marked externally on the uninjured limb, and, at the *p.m.* pus and purulent clots were found in the veins of both limbs, and especially at the junction of the saphenous with the femoral vein; pus was also found in the ankle joint near the seat of fracture, which was two inches above that joint. Patient had fatty heart.

On recurring to the report for the previous year, 1870-71, we find 11 compound fractures, all terminating favourably; and if to these we add the 18 of the past year, 1871-72, we reach the number of 29 compound fractures treated consecutively, and not antiseptically, all recovering except two considered

hopeless on admission, and unfit for amputation, and one which died from phlebitis. It is somewhat remarkable that we had not a case of toxæmia or pyæmia among these, more especially when we remember that, in the same wards, and at the same time, a number of the cases of primary amputation fell victims to this deadly affection. Of course, I refer to toxæmia in its usual form, not to those cases which may with propriety be styled phlebitic. In my former reports, also, it is stated that no peculiar plan of treatment is adhered to in the management of compound fractures; whatever apparatus or position or appliance seems best adapted to the case is employed. From my assistants and dressers I demand great care in dressing, and the early use of water beds to prevent bed-sores. Irrigation is frequently had recourse to when available, and almost invariably with much benefit.

Dislocations, in all 21, divided into 17 simple and 4 compound. The former consisted of eight cases of displacement downwards of the humerus; two of the elbow, the bones of forearm backwards; two of the femur, one of these an example of the most common dislocation of that bone upwards on the dorsum ilii, the other the rare variety into the obturator foramen, and in one respect presenting an appearance differing from that usually described by authors, who uniformly say that the foot, though carried out from the body with the rest of the limb, is neither inverted nor everted, but points straight forward. In this case the foot was decidedly everted, a circumstance remarked and commented on in the operating theatre well filled with students, previous to the administration of chloroform for reduction. Another rare case, a simple dislocation of the astragalus, was reduced by my assistant. The others were of minor importance.

Of the 4 cases of *compound* dislocation, three were of the smaller joints, and out-door cases, all cured; the remaining one, however, was an injury of a very serious character, being a compound dislocation of the ankle, with fracture of the fibula, in one of those unfortunates who may be said continually to soak themselves with mixtures of an anti-teetotal nature, and who rapidly sink under similar accidents, and to this rule our

patient was no exception; he lived only three or four days after admission.

Crushes or Smashes.—These refer chiefly to destruction of the smaller parts of the extremities by disorganizing violence, and of such we had 22 cases, all recovering except one (most of them being out-door cases).

Bruises.—Forty cases—all did well.

Wounds.—Twenty-nine cases—all recoveries, some of these cases were severe lacerated wounds, two of them causing very extensive destruction of the integument of the leg. In covering exposed surfaces thus produced, important assistance was obtained from the process of grafting, of which more may be said when we refer to the cases of

Burns and Scalds, which amount to 20 in number, and of these two died, such fatal terminations being due to the extensive and severe nature of the accidents.

One of the most remarkable of these cases was that of Patrick M'F., who recovered, not only from an extensive and severe injury, but also from an attack of tetanus, and some particulars of his case are worthy of note. His burn or scald was the result of an assault, for which a criminal trial would have taken place had he not at the time been so oblivious by drink, as to be incapable of recollecting the particulars.

P. M'F. was admitted 21st December, 1871 with severe scalds of penis, scrotum, perinæum, and groins, extending along inner aspect of thighs almost to knees. They were dressed with carbolic oil. On 8th January, when the sloughs had all separated, he complained of sore throat and stiffness of the jaws. Next day the abdominal walls were tense, and he was ordered 30 drops every hour of a solution of gr. viii. of extractum physo-stigmatis to 3ij water. On the 12th the tetanic symptoms were rather more marked, but on the 15th they were abated somewhat, though only temporarily, so that chloroform was administered on the 16th with slight benefit. On 22nd January there was again an improvement, which progressed, until, on 3rd February, the tetanus had entirely disappeared. Four grafts of skin were applied to the raw surface of right thigh on the 26th, but did not live. On 16th

March erysipelas began in scrotum, and tincture of muriate of iron was administered, with belladonna fomentations. On the 29th the erysipelas was almost gone and six grafts were implanted successfully. Grafting was practised subsequently on several occasions.

In covering the large surface on the inside of this man's thigh, which was denuded of its integument, the process of grafting was of important service to us, and materially shortened the period required to cover over the extensive field of granulations. Pieces of integument of different sizes and degrees of thickness were at successive intervals applied, and their success, for most of them were fortunate, did not seem to be influenced by either the width or the depth of the graft itself. These were taken from amputated limbs or the man's own sides. One large one became conspicuous in the centre of the sore, expanding to the size of a crownpiece, and by-and-by uniting with the converging coverings around. Several other large surfaces, exposed by the violent removal or destruction of their integuments (lacerated wounds), were treated in a similar manner, and with most encouraging results. It is a great relief to one who has witnessed the tardy closure and frequent retrogression of such cases, to have recourse to such a simple and certain method of abridging their duration, and preventing their recession.

While writing these sentences my attention was attracted to the following passage in a notice of the last edition of Mr Erichsen's surgery by an anonymous reviewer in the January (1873) number of the *Medico-Chirurgical Review*:—"Of skin grafting Mr Erichsen speaks in higher terms than we should have expected. We doubt very much whether it will really be found of so much value as he anticipates. If it only expedites the healing of a healthy sore, that is something, it is true, but not very much. If it does not help to improve the character of the cicatrix, if cicatricial tissue still remains as hard, as prone to contract, as liable to inflammation as before, it is hardly worth while to 'graft.'"

It is hardly necessary to remark that I agree with Mr Erichsen, and it is tolerably evident that the reviewer has

had little or no practical experience of it, and his mode of expression, if he will pardon the remark, savours of the old school. That grafting expedites the healing of a sore is much, and I am satisfied that it improves the character of the cicatrix, and that it diminishes contraction, though it does not prevent it altogether. I look upon it as one of the greatest surgical advances, if not the greatest of the present age, and would give all due honour to our French *confrère* Reverdin.

Tumours, in all, eight cases, equally divided into malignant and innocent. In the former the uterus suffered in two cases, the mamma in one; none of them were operated on; the fourth was epithelioma of the penis, which had been amputated in Ireland, but the disease had returned over the pubes and extended to the glands on both sides, and was considered incurable. The non-malignant included a case of epulis, successfully removed with a bit of the alveolar process; an adenoid tumour of the cheek removed by incision within the mouth; a case of fibroid tumour of uterus, and a case of nævoid tumour, none of them demanding special notice.

Hæmatoma.—A patient affected with right hemiplegia and ptosis, but no aphasia, was admitted for a tumour of the right groin, in the diagnosis of which we were all at fault. The case is so interesting in its pathological revelations, however obscure, that it is here shortly stated. It was thought possible that the piece of projecting bone had something to do with production of the swelling, being likely to press on, if not to enter the femoral vein.

John Y., aged 32, was admitted on 21st December, suffering from a tumour in right groin, observed for three months. It was semi-elastic, fluctuant, and received an impulse on coughing. The pulsation of the femoral artery was traced up to and over this tumour. A continuous bruit was audible over it. There was an incontinence of urine for more than three hours. No disease of lumbar vertebræ. On the 30th a consultation was held, and all the surgeons inclined to the belief that it was an abscess. On January 4, the

tumour was punctured, and a small quantity of bloody fluid was obtained, with grumous matter. The patient sank gradually, and died on the 7th. The following is a note of the *post-mortem* examination.

Ect. Appearances.—In right groin there is a marked prominence, over which the skin is discoloured. The *heart and lungs* are natural. *Within the abdomen*, in right iliac region, there is a prominence passing in from the swelling mentioned above. This prominence has a feeling of fluctuation. To its surface the caput cæcum coli is attached. The surface of the bulging consists of peritoneum, apparently unchanged in structure, and the adhesion of the caput cæcum coli to simple normal attachment dislocated by the prominence described. On dissecting the prominence in the groin above, an irregular cavity is first opened into, containing a very stinking brownish fluid, and a more definite oval shaped mass, which could be very readily separated all round. In size this mass is about as large as the two closed fists, but of an elongated oval shape. With the cavity in which it lies, the prominence in the abdomen described above communicates, and the prominence is found to be formed by a collection beneath the peritoneum of stinking fluid blood. The more definite mass referred to is extremely irregular on the surface, and is composed in great part of blood clot, some of which is dark red and some paler. On the anterior surface, however, there is a softer greyish tissue. On examining the bones of the pelvis, a very irregular pedunculated bony mass is seen to project from the margin of the acetabulum downwards and outwards for about two inches. Though attached to margin of acetabulum it is somewhat moveable, its surface is irregular, and it was found to project into the soft mass described above. *Head.* The tissue round the third nerve of left side is thickened, and several of the branches of the artery of the fissure of sylvius present patches of atheromatous disease. About the middle of the left corpus striatum, near the surface, there is a softened patch.

Gangrene of Foot.—One case. Amputation at the line of demarcation, tetanus, and recovery. This and the preceding case of M'Farlane possess much interest surgically, the former as a large burn, and the latter as a case of gangrene from a slight cause, but both became doubly interesting when we remark that they were the only cases of tetanus which occurred during the year, and both recovered. Opium and the Calabar bean were used in both cases, the latter for the tetanus, the former being otherwise necessary.

Mrs H., æt. 34, was admitted February 12, 1872, from a medical ward, suffering from gangrene of left foot. She was admitted to the ward 5th January, complaining of a pain in left ankle, with slight abrasion, which

had existed for eight months, rendering patient unable to walk. During that time cold cloths had been applied, aggravating, rather than relieving the pain. No affection of heart or lungs being discovered, the pain was thought to be neuralgic, and a blister was applied over malleolus. It did not rise well, and was followed by the formation of a large black slough. This did not separate, except at the edges, till February 1st, when the tendons on outer side of ankle became exposed; the toes became livid, and then black. Patient now complains much of the pain, and has had opiates to procure sleep. Is of a sallow complexion, but not markedly emaciated. Pulse feeble, and easily compressible. There is no sense of hardness conveyed by the vessels, nor is there arcus senilis, or any symptoms of disease of the vessels. Right leg normal in all respects.

Feb. 14th.—Limb removed about junction of lower and middle third of tibia, by means of a large flap from outer, and a small one from inner side.

15th.—One-fourth of outer flap black, and on the following day the inner flap was implicated.

23rd.—The dead parts of flaps which did not extend were removed to-day.

29th.—Stump looking well. For the last two days patient has complained of pain and stiffness of jaw, but somewhat improved to-day. Extract of Calabar bean administered.

March 5th.—Tetanic symptoms a little more marked. Stump looking well; almost no discharge.

8th.—Tetanic symptoms have almost gone. General condition excellent, and stump healing nicely.

Patient continued to improve without interruption, and was dismissed well 25th March.

The Ulcers, forty, do not call for special remark.

Abscesses numbered fifteen, among which was a case of psoas abscess, terminating speedily in recovery. At the same time, in private practice, I treated two cases, in consultation with the ordinary family attendants, both being recoveries, and not treated antiseptically.

Congenital Malformations.—Seven cases noted, and among these three were cases of hare-lip, of which two were double, and presented a wide cleft in the palate. In all a good upper lip was the result of operation. Two were cases of spina bifida, one of which died from the draining off of the spinal fluid after puncture; the other was first punctured, and three or four days thereafter injected with the solution of iodine in glycerine, which I have lately used for the radical cure of this defect, and with perfect success,

the child, when last heard of, being free from complaint. This case has been already noticed more fully in the *British Medical Journal* for June 15, 1872; and in the number of the same journal for 6th April, 1871, the first successful case so treated appeared, and the composition of the fluid injected is given. Dr Watt, of Ayr, has lately treated a case by the same method, with success.

Hernia.—Eight cases—four inguinal, and four femoral. Of the inguinal, two were reduced by taxis, aided by chloroform; two operated upon, one with a good result, the other died. Of the femoral all required operation, two dying, and two recovering. This may be reckoned a saving of five out of eight—a very good result in hospital practice, for the delay in sending such cases is often most prejudicial to them, and for this delay the patients or their relatives are usually to blame.

The Genito-Urinary organs suffered in twenty cases, three of which proved fatal; one of these was a case of chronic cystitis of long standing; another, a case of large hip abscess complicated by syphilis; and the third a case of urethral stricture not very tight, but with advanced disease of the kidneys. One recovery was a case of calculus in a youth, who was cut successfully by Cheselden's method, for which I have a preference over the rectangular operation, as it is named from the shape of the staff used. A few days previous to the performance of lithotomy on this lad, I removed a uric-acid calculus from his urethra by cutting down upon it; the wound healed by the first intention.

Diseases of Bones.—Twenty-one cases were admitted. One of these cases, an example of general enlargement of the tibia, succeeding a fracture sustained many years before. Two were instances of necrosis of the tibia, requiring removal of large sequestra, both ending in restoration of the strength and usefulness of the limbs. The others were cases of necrosis of lower jaw, bones of cranium and radius; with cases of caries of carpal and tarsal bones, and of smaller bones.

Of Diseases of Joints, thirty-nine cases presented.

Hospital cases of this kind are usually of long duration before they seek admission. Chronic is too mild a term to apply to them, the joints are often quite disorganized. We had two or three cases of acute synovitis, which speedily got well by the aid of rest, fomentations, and blisters, etc. The great majority of the cases in this class became the subjects of operation, and were admitted for that purpose, and will be noticed under that heading; so large a proportion as twelve of those implicating the three joints, the hip, the knee, and the elbow. Among the others were cases of hip disease benefited by rest and of other joints treated in a similar way.

Operations — Amputations. — Those who did me the honour to read my hospital report for the year 1870-71, may remember that all the cases of compound fracture treated during the twelve months recovered, and the same may be said of the year now closed, with the single exception of one, among the least severe, which died of phlebitis. Certainly none of them died of toxaemia in its most common and most rapidly fatal form; a form not unknown in some of the other wards, in one of which at one visit no fewer than three cases were shown for consultation. But though our success in the management of compound fractures has been most gratifying, and exceeding even our most sanguine anticipations; or, rather, I ought to say, in excess of what, judging from previous experience, we had a right to expect, yet I regret to say that the results of our primary amputations have presented again a very gloomy aspect. The amputations of the year numbered twenty-five, with a mortality of nine; of these ten were primary, one-half proving fatal, leaving fifteen secondary with four deaths, and eleven recoveries. To these must be added twenty out-door operations, for slight injuries, all of which recovered. The deaths in five cases may be ascribed to blood poisoning.

It is somewhat strange to find that two cases of primary amputation in the arm, and one in fore-arm, all proved fatal, as well as two in the leg, con-

stituting the whole mortality in the primary cases; while of two primary amputations at the knee-joint, and three secondary (for disease) at the same part, the whole five recovered. In two of these cases the patella was left in the upper flap, and the leg removed by disarticulation, the synovial surface on the femur condyles being left untouched, and in both, the stumps were excellent. In treating such cases, and in amputations of the thigh in its lower third, of which we had five with three recoveries. I have lately adopted a plan which may now be noticed.

Extension applied to Stumps.—In order to prevent, or at least lessen, the retraction caused by the muscles severed from their points of insertion, strips of extension plaster, three or four, are fixed to the limb by the aid of a bandage, and a weight attached so as to keep up continuous traction. This ought to be applied either immediately after the operation, or at the first dressing, even when the flaps are sufficiently long; it offers no excuse for short flaps; has been found advantageous, and has been used in other amputations as well. It does not interfere with the facility of dressing the stump, as the plaster strips can be doubled up for a few seconds to allow of this.

For some months we have used in these wards an antiseptic dressing—namely, benzoic acid, at the suggestion of Dr Dougall, Paisley Road, Glasgow. Watery and oily solutions have been tried. It is not very soluble in water, each ounce taking up barely a grain and a half of the acid, whereas oil takes up nearly 15 grains per ounce. Dr Dougall had found by his experiments that it excelled a long list of other substances in antiputrescent power, but I am sorry to report that, as yet, I have seen no reason to believe that it has been of much benefit to us in surgery. It will at once occur to all that benzoin, if not the acid, is an important constituent of the old riga-balsam, or wound balsam, which, though not now in fashion, is probably as good an application to recent wounds as we yet possess. Speaking of antiseptics, it is worthy of note that, during my holiday in summer, two severe cases were treated antiseptically by carbolic acid,

one of which died in two days, the other a compound fracture of femur was found on my return, three weeks after admission, to present an extensive abscess running along the femur, and pointing at its outer aspect, which required free incisions for its evacuation; and the case, after a prolonged struggle, is now doing well, though still in hospital.

In regard to the *choice of place in amputations*, let me add that, if I am not misreading the lessons derivable from experience, it appears to me—1st, That it is safer to amputate at a joint than anywhere through a bone, especially a long bone, and that the synovial surface of the bone not removed should be left completely intact, or as nearly so as possible. 2nd, Referring to the lower limb, it is safer to amputate through the knee joint or femoral epiphyses than through the upper ends of the tibia and fibula, even in cases where sufficient flaps to cover these can be obtained. The risks of pyæmia supervening will thus be much diminished.

Excisions of Joints.—Seven cases. Two of these were excisions of the head of the femur in what are called morbus coxæ cases, both being unfortunate, the one from exhaustion, the feeble system of the child being unequal to the demands made upon it by the drain from the wound and open joint, added to the confinement. The other, I suspect, died from preventible causes; his position in bed after the operation should have been more carefully attended to. At whose door the fault lay it is now difficult to say. He died from blood poisoning, much to my regret, as I had reason to expect success in his case.

The other five excisions were of the elbow, all successful, and resulting in useful arms.

Hare lip.—Three cases of this deformity were operated on, all with very good results, though one was a case of double hare lip, with a projecting intermaxillary bone, and in this instance I succeeded in making a fair septum nasi.

Vesico-Vaginal Fistulae in three instances were operated on, one was cured, the others, very difficult cases, were improved, and directed to return after a certain time for re-

operation. A case of ruptured perineum was cured by operation.

The operations for hernia, the case of lithotomy, and the removals of tumours have already been referred to with their results.

In concluding this report it is interesting to notice that we had two cases (though classed in separate sections on account of other characters), which became the subjects of tetanus, and that both recovered under the use of the Calabar bean, opium being in use at the same time, indeed at the time of the occurrence of, or onset of trismus. In both instances the attack was mild, and in such cases it is generally possible to predict a favourable termination, consequently they are not to be considered as proving the efficacy of this remedy in acute cases, though they tend to justify its further use.

VII.—RETROSPECT OF FRENCH MEDICO-PSYCHOLOGICAL LITERATURE, WITH OBSERVATIONS ON GENERAL PARALYSIS.

By DR ALEXANDER ROBERTSON.

DR J. DROUET, in the numbers of the "*Annales Médico-Psychologiques*" for July and September, 1871, contributes an excellent paper on the Diagnosis of General Paralysis; and at the meetings of the *Société Médico-Psychologique*, in May and June of last year, its pathology was discussed by several distinguished members. We propose giving a digest of the more important opinions expressed in these communications; but as valuable articles have also been recently published on the same questions in England and Germany, we shall collate them with the others, so as to convey a more correct idea of the present state of our knowledge of this important combined disease of body and mind. We shall first, however, make a few preliminary observations on its title.

Name.—The designation General Paralysis has been much objected to, on the ground that it conveys a very imperfect impression of the disease, particularly in its first stage. There is good reason for this objection, for, in a considerable proportion of cases, mental disorder precedes the bodily symptoms; and besides, even when the two occur simul-

taneously, or the latter appear first, the motor defect at the outset, especially when its origin seems to be spinal, partakes more of the nature of defective co-ordination than of distinct palsy. General paresis, proposed by M. Salomon, has been adopted by some writers, but it is indefinite, and somewhat similar objections may be urged against it. Dementia paralytica has lately been used by Dr Wilks and other authorities, and, undoubtedly, when the disease is fully established it is very appropriate, correctly indicating the condition, both mental and physical; but it is too comprehensive in its signification, as it is quite applicable to many cases of hemiplegia with weakness of mind, which certainly ought not to be included in the same class with the forms of the disorder we are now considering. In short, we doubt very much if any title has yet been proposed, or, indeed, can be produced, considering the present state of our knowledge, against which as valid objections may not be urged as against the old one originally given it by Bayle and Calmeil, namely, general paralysis.

Pathology.—The earlier observers, and even now many medical superintendents of asylums, whose sphere of observation has been restricted to cases which are sent to these institutions, have been too much disposed to regard general paralysis as of a specific nature, as possessing distinctive features which sharply define it, distinguishing it from other disorders of the cerebro-spinal system. No doubt, did the portrait, so admirably sketched by Calmeil, of the form in which it is so often seen in asylums—exhibiting, as it does, the remarkable grandiose delusions, along with the gradually advancing paralysis and other phenomena—did that portrait fitly represent *all* the forms of the disease, the belief would be well founded. But this is not so. It is applicable only to an important variety, and there are others whose course and results are similar, but which differ to a certain extent in their symptoms, and yet are fairly entitled to be included in the same general group.

The degree of difference on this question may be inferred from the fact that at present it is a subject of controversy whether insanity ought to be regarded as an essential of the disorder at all, and ought not rather to be considered as secondary, or an epi-phenomenon, the paralysis being the basis on which the mental disorder is grafted. This idea would seem to have arisen from the occasional though rare occurrence of cases in which the morbid action apparently crept up to the mental centres from the spinal cord, and also

from the uniformity with which pathological changes are found in the latter centre. But how rare the cases are in which the paralytic symptoms take distinct precedence of those characteristic of mental disorder may be estimated from the remark of so trustworthy an observer as the late Professor Griesinger, that "this paralysis is never met with in individuals who are mentally healthy."* However, this statement requires to be qualified. Thus Dr Boyd, of the Somerset Asylum, mentions three cases that had occurred in his experience where the intellect was sound; and I myself have had several patients under my care in whom the paralysis was associated simply with weakness of intellect, not insanity. The cases in which locomotor ataxy terminate in general paralysis also show that the motor phenomena may be present without the mental. In reference to this class, MM. Bouchereau and Falret stated, at the June *séance* of the Médico-Psychological Society of Paris, that three such cases had been under their observation, and M. Foville relates in detail a case in which the delirium of grandeur was all of a sudden superadded to the symptoms of ataxy.

It is now generally admitted that the symptoms of mental unsoundness accompanying or preceding the paralysis are by no means uniform. Thus, instead of a feeling of exaltation, with delusions of wealth, power, &c., there may be melancholic insanity, with perhaps morbid suspicion; and in some instances these opposite mental states occur alternately.

Briefly, then, the following forms of general paralysis may be recognised†:—

- 1st. Cases in which the psychical disturbance precedes the motor by a short interval.
- 2nd. Cases in which the psychical and motor symptoms appear simultaneously, or nearly so.
- 3rd. Cases in which the motor phenomena are fully developed before the mental manifest themselves.
- 4th. (Very rare) Cases in which the paralytic symptoms proceed to a fatal termination without mental disturbance.

* Mental Pathology and Therapeutics. By W. Griesinger. New Sydenham Society's Translation; page 393.

† At present, under my care, there are illustrations of general paralysis (1) with exaltation and magniose delusions; (2) with melancholic depression and dementia; (3) with simple enfeeblement of mind without distinct alteration in the mental tone; and (4) of locomotor ataxy with a degree of mental weakness. I shall willingly show these cases to any member of the profession who may feel interested in the subject.

Then, with regard to the nature of the associated mental disturbance, the following varieties have been observed :—

- (a) Cases in which exaltation, along with grandiose delusions, persists to the close.
- (b) Cases in which melancholic feeling prevails, and is often accompanied by delusions of suspicion.
- (c) Cases in which the mental tone and delusions of the two preceding varieties alternate at irregular intervals.
- (d) Cases in which throughout the whole course there is no positive insanity, but a progressive enfeeblement of intellect.

It is to be observed, also, that the mind, in almost all cases, even at the commencement, manifests a greater degree of weakness, along with the mania or melancholia, as the case may be, than in similar forms of insanity without paralysis.

The morbid changes observable by the naked eye in this disease, or group of diseases, are very decided, and are more uniformly present than in ordinary insanity. But we need not dwell on them, since they are published in systematic works on mental disorder. We proceed to refer to the microscopical appearances recently described by pathologists. Dr Sankey* has given much attention to the condition of the small arteries and capillaries in the cortical substance of the brain in general paralysis, and also in the ordinary forms of insanity. He found the arteries apparently normal in all except one of the eight paralytic cases which he examined; but the capillaries were all more or less varicose. In ordinary dementia, on the contrary, he states that hypertrophy of the arterial walls was a nearly uniform condition. But doubt is cast on the reliability of these conclusions by Dr Westphal, of Berlin, who says† that all the drawings and descriptions of conditions regarded by Sankey as pathological are “merely representatives of a normal condition of the vessels.”

Tigges states that the cells of the hemispherical ganglia undergo a marked degeneration; that their nuclei, more especially, are increased in number; and Meschede insists that the leading morbid change is a fatty and pigmentary degeneration in the ganglion cells in the inner layer of the cortical substance, this being the result of chronic inflammatory action. He also found the cells calcified in some cases. It is highly probable that degenerations such as these writers describe

* *Journal of Mental Science*, 1869, p. 446.

† The same *Journal*, p. 506; Translation by Dr Rutherford.

do really occur as a result of the morbid action in this disease ; but it is proper to state that Westphal affirms that the appearances held to be morbid by these observers may be seen in healthy brains in advanced life.

There is now a tolerably general concurrence of opinion amongst pathologists that there is an increase of the neuroglia—the delicate connective tissue of the brain discovered a few years since by Virchow ; and this is considered to be effected by a proliferation of the nuclei, and a fibrillation of the normally amorphous basis substance. It is believed that the result of the hypertrophy of this tissue is a general condensation of the white substance of the cerebrum, with atrophy or destruction of its fibres. So convinced are French alienist physicians of the uniformity of the occurrence of this condition, that when M. A. Voisin at the *séance* of the French Psychological Society in May last, said that because on *post-mortem* examination in a case, which had been under his care, he could observe hyperplasia of the neuroglia, neither in the cerebral substance, nor around the capillaries, he concluded that the patient did not labour under general paralysis, the statement was received with acceptance by the members present, even though a diagnosis of that disease had previously been made by so eminent a physician as M. Baillarger, and the ordinary symptoms were confessedly present.

Dr Lockhart Clarke has published* an account of the microscopical appearances observed by him in the brain of a general paralytic, who died in the institution with which I am connected. The patient had also previously been under Dr Gairdner, in the Glasgow Royal Infirmary. The most striking morbid alterations were the presence of numerous small cavities of various shapes, which were noticed in the cerebral convolutions, the right optic thalamus, and the posterior part of the pons on the right side, close to the roots of the facial nerve, and in the anterior pyramid of the left side as it ascends through the pons. These he considered to be almost certainly “perivascular spaces or canals which contained blood-vessels surrounded by their peculiar sheaths, and which subsequently became empty by the destruction and absorption of these vessels.” In this case, also, Dr Clarke observed certain changes in the grey substance of the convolutions. “In some places the nerve cells were unusually loaded with pigment granules ; in other places they had undergone, to a greater or less extent, the process of disintegration ; while here and there were scattered over areas of variable extent irregular masses of fat particles of different shapes and sizes.”

* *Journal of Mental Science* for 1870, p. 499.

It is, however, to be observed that all these changes in the cerebrum, whether in or around the vessels, in the connective tissue, or in the proper structural elements—ganglion cells or fibres, have been found in cases of chronic insanity without paralysis, and even in idiocy (Wedl), and are therefore not distinctive of the disease we are considering.

Westphal, who is so sceptical about admitting the appearances described by other observers in the brain to be morbid, has paid much attention to the state of the spinal cord, and records certain pathological changes in that portion of the central nervous system which he says are among the best attested facts in the pathology of the disease. Till lately, too little attention has been paid to the condition of this organ. It is, however, due to Dr Boyd, of Somerset Asylum, to say that, as far back as 1849, and repeatedly since then, he has referred in different publications to the indications of meningo-mylitis observable in *post-mortem* examination of cases of general paralysis.

The specific changes observed by Westphal are, shortly stated: First, connective tissue in bands or plates in the posterior columns of the cord, along with atrophy or even almost total disappearance of the nerve element; the disease in this class being limited to these columns. In the second and third groups of cases the morbid appearances are limited in the one to the posterior part of the lateral column, and in the other to this line of tissue, along with the anterior part of the posterior columns. The character of the alterations is the same in both—viz., the constant presence of nucleated cells, and hypertrophy of the connective tissue in a reticulated form, not in bands or plates as in the first group.

These observations of Westphal's are very important, but he has been too sanguine in concluding that "hereby the universal product of spinal disease among the paralytic insane is indubitably settled." For though Th. Simon has since corroborated them in respect to the uniformity in the occurrence of such morbid changes in general paralysis, he holds that they are not pathognomonic, but are present in other diseases of the cord, and that cells similar to those described by Westphal are found in different parts of the spinal marrow in cases where there had been neither paralysis nor insanity. And very recently Prof. Ludwig Meyer has confirmed these statements of Simon. He has published observations of eighteen patients, mostly in advanced life,

who died from different affections other than insanity or paralysis in Hamburg Hospital. In them he found fat granules and granule cells, besides other evidences of degeneration, both of vessels and nerve elements, in the brain and all parts of the spinal cord.

It is worthy of note that Drs Poincarè and Henry Bonnet, in the "*Annales Médico-Psychologiques*" for 1868, directed attention to the state of the cervical sympathetic ganglia in general paralysis. They say—"The cells of the whole chain of the great sympathetic are covered with brown pigment to a degree much more intense than in other subjects, from whatever affection they may have suffered. In the ganglia of the cervical region, and often in the ganglia of the thoracic, there is evidently a substitution of cellular tissue and of adipose cells for the nerve cells, which last are comparatively rare. The adipose cells, which are substituted for nerve cells, often exhibit a depth of colour which may be even quite black."* These observers are inclined to think that disease of the sympathetic is the starting point of the affection. I have not noticed that their observations have been confirmed by other pathologists.

The ophthalmoscope has thrown some light on the pathology of the disease. Westphal, Clifford Albutt, and Aldridge have published the results of their observations. The last named gentleman, in his paper published in the West Riding Asylum Report for 1872, says—"After a careful consideration of the cases as given in the tables, it will at once appear that only two conditions of the optic nerve were observed, although these differed considerably in different patients, in the two eyes of the same patient, and even in different parts of the disc of the same eye. Some discs are described as being of a pink tint and hazy appearance; others as being of a deep hazy red tint, and slightly swollen; whilst a third class are said to be white with a very faint capillary tint; and lastly, some are described as being quite white and atrophic. It would thus appear that the affection commences by inflammation and slight exudation, and ends in atrophy. Now, this closely corresponds with the course of the disease known as descending neuritis, which is thus described by Mr Soelberg Wells:—"In the descending neuritis the tissue of the nerve is more diffusely clouded (than in the engorged papilla), but the swelling and redness of the disc are much less, and its tint is of a pink grey; the retinal arteries are diminished in calibre, but the

* Translated in the *Journal of Mental Science*, July, 1869.

veins are less dilated and tortuous than in the engorged papilla. As the disease proceeds, the exudation becomes absorbed, the vascularity diminishes, and the disc slowly grows white.' "

Causes.—As I am disposed to agree in the opinion expressed by Griesinger that "the causes are still buried in obscurity," I would scarcely have adverted to this point had it not seemed to me desirable to call in question the view expressed in the recent excellent work on insanity by Dr Blandford. He says—"There is another form found in those of middle age, the result of sexual excess or masturbation, which is known under the name of general paralysis." And again, "Suffice it to say that I believe the chief cause is sexual excess, whether in married or single life." Had this strongly expressed opinion been correct, it might have been expected that prostitutes would be specially liable to the disease, and that married women would be subject to it in as large a proportion as married men; and that in such institutions as the one under my charge female general paralytics ought to be commonly met with. But the fact is, though I am constantly seeing the disease in its various forms in men, it is rare and quite exceptional that a woman suffering from it is under treatment. Besides the form of insanity which results where masturbation or sexual excess is known to be the cause differs materially from that most frequently associated with general paralysis. There is likewise a material difference in the aspect and bodily condition of the two classes. The former, as a rule, are pale, exsanguine, and look exhausted; while the latter, in the early stage of the palsy, are very frequently full of flesh and blood, and their appearance does not suggest the idea that a drain has been enfeebling their constitutions. Further, it is a rare disease under thirty; but this immunity ought not to exist, if the alleged cause were the real one, for there is no reason to think that the sexual appetite in one way or another is less freely indulged, say between 25 and 30 than about 40 years of age, when the disease is common. We cannot, therefore, accept the theory as sound that general paralysis is peculiarly the result of sexual excess.

Occurring, as it does, chiefly in men in the prime and vigour of life, we naturally, in endeavouring to trace the causation, consider what are the conditions which specially dispose that class of the community to disease of the cerebro-mental system. In young manhood the muscles, and consequently the great *motor* centres of the nervous system, are much exercised, as a

general rule; and as yet the full responsibilities of life have not been undertaken. By-and-by this is changed; the strain is concentrated principally on the highest centres, those, namely, associated with the operations of the intellect. The feeble give way, and disordered mental action is manifested. Why in one man the form assumed is ordinary insanity, and in another general paralysis, cannot be determined, and perhaps depends on innate differences of construction too fine to be appreciated.

Diagnosis.—When the ordinary symptoms are present and distinctly marked, there are few diseases more characteristic, or more easy of recognition. But it often happens that important symptoms are absent, and, in fact, cases differ from each other so materially, and from the typical standard suggested by the form so common in asylums, that it is frequently a matter of very great difficulty to arrive at a definite conclusion regarding any particular one. This difficulty, as M. Drouet says, is due to the circumstance “that general paralysis has no pathognomonic sign, that it has a very irregular progress, and that it is not possible to differentiate it scientifically, that is to say, in an absolute manner, from many nervous affections in which troubles of motility are associated with troubles of intelligence.” Dr Drouet enumerates a large group of disorders with which it is sometimes confounded. We shall only consider two of them—namely, senile dementia, with disorders of motility, and chronic alcoholism. In reference to the former, he has adopted the signs formulated by M. Kraft-Ebing, and as they are concisely expressed, we quote them in his own words.

“Let us say, at first, that considerations drawn from the age of the patients have very great value, since general paralysis decreases extraordinarily above 45, and particularly above 60, while senile dementia begins to get common after the latter age. In this last malady the symptomatic phenomena follow a march much more regular, and present a stability greater than in the former. In general paralytics the pupillary inequality is frequent, but very variable from one time to another; in the old, in dementia, on the contrary, it persists or increases with a slowness full of regularity. The two maladies begin, as a rule, in a very different manner. Maniacal agitation coincides without doubt sometimes with the invasion of senile dementia, but it is not then accompanied by the same impetuous manifestations, or by a like excessive tendency to motion. While the exacerbations of excitement rarely recur in senile dementia, they repeat themselves even to an advanced period of general paralysis, even when the powers of the patient are considerably exhausted. In this last affection the troubles of motility are

generalized; they consist chiefly in co-ordination of movement and in temporary paralysis, while in senile dementia they are rather localized, affecting ordinarily only one side, are accompanied not unfrequently by contractions, and have a character of remarkable permanence. In senile dementia it is extremely rare to observe the epileptiform convulsions, the grinding of the teeth, the fibrillary tremulousness of the lips, the repeated attacks of apoplectic congestion, and chiefly the remissions common enough in general paralysis. Lastly, the ambitious delirium is far less frequent in this last malady."

Diagnosis from Chronic Alcoholism.—Dr Blandford, in his work on insanity, to which we have already referred, says, in reference to this point, "it (chronic alcoholism) is easy to be distinguished." How far this is from being correct, will be understood from the statement of M. Drouet that in no less than thirty-four cases which had come under his observation, the one malady had been mistaken for the other, and by medical men "whose scientific authority cannot be contested for a moment." In fact, he holds that in very many cases they cannot be distinguished from each other, and that "there is room for reuniting under a common denomination, and of considering as perfectly similar a very great number of cases of general paralysis and of chronic alcoholism, with disorders on the side of motility. They are not two distinct maladies, and there is no ground for describing them separately." My experience leads me also to think that they are often indistinguishable, for I have had cases under my care, in which, up to their fatal conclusion, I was unable to conclude, apart from their history, whether they ought to be regarded as the one or the other of these disorders. And yet in other cases their distinctive features are very obvious. For instance, it often happens that the paralytic symptoms of chronic alcoholism are those of tabes dorsalis, and the speech is but little effected; or, if it is, the defect is a slowness or feebleness in articulation, rather than the peculiar stuttering, indicative of defective co-ordination, observable in the early stage of general paralysis. And the mental symptoms indicate stupidity and weakness of purpose, without positive delusion, differing decidedly from the exaltation and ambitious delirium, so prominent in typical cases of the paralytic affection.

But though so similar in very many cases, so far as their symptoms are concerned, we are not, therefore, warranted in regarding them as one malady, differing only in degree, as M. Drouet would have us think. On the contrary,

the observations of M. Auguste Voisin have led him to the conclusion that they are totally different in nature. This gentleman read a paper to the French Psychological Society, at the *séance* of last May on the influence of different alcoholic drinks on the form of the delirium, in which he referred to the question we are now considering, and stated his conviction that "general paralysis cannot be produced by any of the alcoholic liquors, and that the alterations in it and those of alcoholism are essentially different." His remarks on the differential anatomical characters of the two diseases are worthy of translation. He says—"The autopsies which I have made have taught me that the cerebral lesions proper to alcoholics consist in fatty and atheromatous degenerations, in dilatations of the arteries, in sanguineous exudations into the perivascular spaces (*gaines vasculaires*), and in the cerebral substance, in cerebro-meningeal congestion and oedema, and that there exists no hyperplasia of the connective tissue, no proliferation of the nuclei—that is to say, that alcoholism leads to degenerative lesions, and not to inflammatory alterations. We may find many opacities, milky spots on the meninges, but they have no adhesions to the brain; we may see at these points exudative alterations, but they are not inflammatory in their nature. It may be objected that inflammatory lesions are observed in habitual drunkards in the serous membranes, and particularly in the pleura; but these lesions, really inflammatory, are due not to the primitive action of the alcohol, but to the exposure to the sun, cold, or rain, to which drunkards subject themselves for hours together."

Treatment.—I fear we are not yet in a position to speak encouragingly in regard to the results of treatment, at least in respect of complete recovery. Certainly several cases are on record of alleged cure; but they are not well authenticated in regard to diagnosis. The remissions, too, occasionally nearly complete, which occur sometimes in the course of the disease, are apt to give rise to misapprehensions regarding the ultimate issue of the case. There can be no doubt, however, that much good results from judicious treatment, both in checking the progress of the disease and in overcoming troublesome symptoms, such as the maniacal attacks to which many patients are subject. I am glad to see that Dr. Crichton Browne has lately recorded favourable results from active measures both local and constitutional. A case under my care about a year ago improved rapidly and in a very marked degree under the use of first, the green iodide of

mercury, and afterwards a combination of Liq. strychn. with Tr. ferri perchlor., both in regard to the paralysis and the mental symptoms, even though no indications of constitutional syphilis were present.

We have entered somewhat fully into the various questions connected with general paralysis, as it is a disease of much interest to the general practitioner. Most of the other articles in the "*Annales*" relate to the various forms of insanity, and are of special value to the alienist physician. We shall give, however, a brief abstract of the more important ones.

Stupor in Mental Diseases.—Dr Dagonet, physician to the Asylum at St Anne, contributes an elaborate and exhaustive article on this subject. He particularly refers to the form of insanity known as melancholy with stupor, and reviews the published opinions of the many eminent French physicians who have contributed to its elucidation. The question which has been specially debated is this—Does the disorder consist in a prostration or suspension of the mental powers, so that they are incapable of exercise, or is the mind so enthralled by an overpowering idea of a melancholy nature that impressions coming from without are scarcely apprehended, so that they produce little or no response, and even those arising within, so far as they occasion voluntary acts, are equally unheeded, the patient being often neglectful even of the calls of nature. The conclusion arrived at by Dr Dagonet is one which, I think, must commend itself to those who have had sufficient opportunities for observing the varieties of the disorder—namely, that there are two forms of "stupidité," one without, the other with, delusion. They are readily distinguishable in most cases by the facial expression. In simple stupor the features are relaxed, the physiognomy is stamped with insignificance, it denotes *inertia*, the absence even of thought, or at least the penury of the ideas. In the other form the features are contracted, "and the aspect, impressed with sadness, reveals nevertheless, by the activity which it presents, the persistent activity of the thought."

A young woman who was under my care about six months ago was an excellent illustration of the form associated with delusion. She never spoke except on rare occasions, in monosyllables, and irrelevantly, giving no heed to what was passing around. She sat in the one posture, with eyes generally turned to the ground. The rigidity of her features, expressive of thought and emotion, painful and intense, showed that her condition was not the result of inertia of

the faculties, and the correctness of this view was further evinced by the desperate attempts she made several times to go up the chimney, obviously under the influence of overpowering delusion, the nature of which she never revealed.

On the influence of Alcoholic beverages on the form and the increase in the number of cases of Insanity.—M. Auguste Voisin, in the paper to which we have already referred in our remarks on general paralysis, submits the following conclusions at which he has arrived on this subject as the result of numerous observations :—

1. That the nature of the alcoholic liquor has no special influence on the form of the delirium, and that the liquors of absinthe do not determine symptoms different from those which are produced by other liquors or drinks.

2. That a particular liquor does not lead to any special malady or degeneration in the children of drunkards, even though they may have been conceived during drunkenness.

3. That the delirium of grandeur, of riches, of satisfaction is sometimes present in alcoholism both acute and chronic, and that it cannot be considered as a symptom which distinguishes general paralysis from chronic alcoholism.

4. That the liquors of absinthe do not alone possess the fatal privilege of provoking epileptic attacks.

Dr Lunier, in a very careful and valuable paper contrasts the increase in insanity from alcohol in the various provinces of France with the consumption of the respective alcoholic liquors in each province. We subjoin the more noteworthy of his conclusions :—

1. Spirituous liquors, and particularly those made with beet-root and grain-spirits tend in all parts of France to displace natural liquors, such as wine and cider.

2. In all departments where cider was recently the only drink known, its consumption and consequently its production tend to decrease.

3. In these same departments, and generally in all those which produce only a little or no wine, ordinary wines, the consumption of which was becoming pretty common, cannot now compete with the alcohols of the north, the cheapness of which tends to generalize the consumption.

4. Spirits (alcools d'industrie), which were at first consumed only in certain departments of the north, have gradually become more and more widely used in all France.

5. Considering the country as a whole, the consumption

of alcohol has almost doubled from 1849 to 1869. Now it amounts to 2.54 lit. per head.

6. In the same period, or more exactly, from 1857 to 1868, the relative number of cases of insanity from alcohol has increased 59 per cent. in men, and 52 per cent. in women.

7. In the departments which produce alcohol, but neither wine nor cider, the annual consumption has increased from 3.46 lit. to 5.88 lit. per head. In these same departments the proportion of cases of insanity from alcoholism has increased from 9.72 to 22.31 per cent. in men, and from 2.77 to 4.14 in women.

8. Alcoholic excesses act, not only in determining attacks of *delirium tremens* or of alcoholic insanity, but also in placing the parents, at the moment of conception, in very peculiar conditions, which have an evil influence on the physical health of the children, as well as on their development intellectual and moral.

9. The increase in the number of suicides has followed, throughout all France, the increase in the consumption of alcoholic liquors.

Variola and Insanity.—Dr Chatelain states that twelve cases of small-pox had occurred within a short period in the asylum under his charge. The results on the mental condition were entirely negative; the patients, after recovery from the small-pox, were neither better nor worse than previous to its occurrence. Cases, however, have been reported in which this and other diseases, particularly typhoid fever, appeared to exercise a favourable influence on the mental disorder.

On the Influence of the Events of the late War on the Development of Insanity, and also on the Insane in Asylums.—As was to be expected, a number of papers have been published on this subject, and it was also discussed at the *Société Médico-Psychologique* in June, 1871. The articles, as a whole, are highly interesting and instructive; but we do not see that any very important conclusion has been arrived at by any of the writers. We can only very briefly direct attention to a few of the more important points brought forward in these communications.

Dr Morel shows, and other physicians agree with him, that pantophobia, with wailings, was a form of disorder frequently seen, especially in women. The sufferers, he says, "are constantly moving about, and are the victims of the pangs of fear and despair. They say they are condemned

to be burned, buried alive, &c., and nevertheless, they cease not to repeat that they are innocent. They are not, as a rule, violent or disposed to suicide."

This form of mental disorder appeared more especially in the districts which were in the immediate vicinity of the invaded ones, and was not so prevalent where the Prussians were actually present. It is ascribed to a feeling of apprehension and dread of the foe, which was increased greatly by the exaggerated stories current amongst the population, of atrocities perpetrated by the Prussian soldiers. Dr Morel thinks that the features of this pantophobia are so distinctive that it ought to be regarded as a special variety of the lypemania of Esquirol, or of the melancholia of the ancients.

Dr Lunier, who contributes a valuable statistical paper on the subject, corroborates this statement as to the prevalence of melancholia, particularly in this pantophobic form, in women, but not in men.

M. Legrand du Saulle observed a considerable number of cases of *melancholie avec stupeur*, which is a somewhat rare form of insanity in ordinary circumstances. This gentleman's recorded experiences within Paris during the two sieges are exceedingly interesting.

From Dr Foville's statements it would seem that the inmates of Charenton Asylum, generally speaking, took no interest whatever in the vast military preparations and engagements which were observable from the Institute. Many of them, and notably a captain of the Imperial Guard, refused to be convinced of the reality of the contests which were going on around, and held that the war was a pretence or mere comedy, that the guns which they heard discharged were only loaded with powder, and were intended to frighten them.

Nomenclature and Classification of Mental Diseases.—Dr Archibald Foville, in a paper published in the "*Annales*" for July of last year, discusses the various classifications which had been proposed in France from Pinel's time downwards, and closes by adding another to the long list of systems. It is a division based on the symptoms, and seems very good of its kind. We doubt, however, if much is to be gained by adopting this principle in any new system. For my part, I find that while still adhering in the main to the good old divisions of Pinel and Esquirol into mania, melancholia, monomania, dementia, and idiocy, I am gradually adopting the one proposed a few years since by Dr Skae, of Morningside Asylum.

It would be easy to point out objections to it, but upon the whole it has a good practical bearing, directing attention to the indications for treatment; and in this lies its special value.

Dr Batty Tuke, of the Fife Asylum, has published a modification of Dr Skae's classification. It does not, however, appear to have any particular advantage; on the contrary, it rather complicates a simple and useful method, and would retard its general adoption.

VIII.—SHORT COMMUNICATIONS.

1.—ON THE USE OF CARBOLIC ACID AS A COUNTER-IRRITANT, by FRANCIS HENDERSON, M.D., *Helensburgh*.

WHEN pure carbolic acid is applied to the skin, in less than a minute the part becomes perfectly white in colour, and some smarting is experienced, which lasts from two to four minutes, and then entirely ceases. The caustic action penetrates the epidermis, and seems partially to destroy the superficial layer of the cutis vera. The peculiar benumbing influence which carbolic acid exerts upon sensory nerves may explain the rather sudden cessation of the pain, which, at all events, cannot be due to the destruction of the entire sensitive layer of the true skin as occurs in severe burns. In the course of a few hours symptoms of inflammation of the parts begin—heat, redness, and some pain—which vary in degree according to the quantity of acid applied. As regards the pain, some patients describe it as more, some as less, than that produced by an ordinary fly blister. The skin remains somewhat inflamed for several days, the symptoms gradually abating, and at the end of six or eight days a thin yellowish crust comes off in pieces, leaving the skin beneath smooth, shining, and rather tender. In no part of its course does the inflamed skin pour out serum or discharge pus, so that any linen which may be in contact with the part is scarcely, and in some instances not in the least, stained.

Such are the general results of applying carbolic acid to the skin. Its use as a counter-irritant was suggested by the case of a patient who has been for four or five years the subject of chronic Bright's disease of the kidneys. The amount of albumen in the urine was increasing, and the symptoms of what may be termed renal dyspepsia were becoming urgent, and had resisted very numerous remedies, when it was determined to try the effect of active counter-irritation over the loins. As cantharides was, under the circumstances, contra-indicated, it occurred to me that carbolic acid would be a proper agent for the purpose. Accordingly, a patch of skin over each renal region, in size about two inches square, was painted with pure carbolic acid. The appearances produced were such as have been described. The application was followed by a diminution of albumen in

the urine, and by immediate abatement of the renal symptoms. Counter-irritation was kept up for several weeks by re-applying the carbolic acid, and the symptoms continued abated. That the favourable turn of the symptoms in this case was due to the application of the carbolic acid seemed very certain, but it is not the object of this communication to illustrate the value of counter-irritation as a therapeutic principle. We take it for granted that there are few remedial measures regarding whose value medical men are so generally agreed.

I have used carbolic acid in a good many other cases with much benefit. No special or specific virtue is claimed for this agent. It is merely as a powerful and manageable counter-irritant that it is recommended, acting as powerfully, or (if much is used or a second application made) much more powerfully than an ordinary blister, and at the same time possessed of this peculiarity, that it produces no drain from the system, a peculiarity which is often of vast advantage in weak individuals, or in those exhausted by long or severe illness, when oftentimes the physician is deterred from applying a fly blister from the fear of its depleting and weakening influence. Another advantage, though one of less moment, is this, that inasmuch as there is no discharge, no dressing is needed, and much annoyance and trouble is thus avoided.

2.—ON CERTAIN RISKS ATTENDING THE USE OF BROMIDE OF POTASSIUM,
by JAMES MORTON, M.D., *Professor of Materia Medica, Anderson's University, Glasgow.*

NOT long after the discovery of bromine, the local anæsthetic action of bromide of potassium, now called potassium bromide, was noticed and named as one of the properties of the salt; and this effect, as exemplified in its applications to the pharynx, was well known to practitioners. By them it was used therapeutically, when it was desirable to dull or diminish the irritability of these parts, as a preparative to the application of medicated substances to the glottis or air passages. In whooping-cough, also, it was used to abate the tendency to cough, by averting that portion of it which might be supposed to arise from the irritation produced by the frequency of the spasmodic movements in the throat. Previous to the explorations of the laryngoscope, it was also employed as a gargle, and thought to be useful.

Much more recently, this bromide has become known as a new sedative, as some term it, or as a calmative or general anæsthetic, when used internally or constitutionally, and, as such, it has been found eminently beneficial in certain forms of nervous excitement, and even in maniacal cases, where it is used either alone or in combination with other remedies believed to favour the production of this effect. To specify all the different classes of cases in which it may be employed with advantage

is not my object at present, but I may be allowed to allude to one, its use in epilepsy, many cases of which are cured or alleviated by it. Its power as a general sorbefacient may also be passed over at present.

Doubtless it deserves many of the encomiums that have been heaped upon it, and it may be used with much benefit to many sufferers, if, in the selection of cases, a proper discrimination be observed. But let us suppose an opposite condition, either that there is no selection, and that it is used because it is the fashion, or that an improper selection is made, let us call it a mistake, then it will be found that it is nearly as potent for evil as it has been affirmed to be for good. A very few cases have come under my observation which illustrate this, and I now give them in the order of their occurrence, and the more readily that in at least one of the cases I was, for a time, puzzled to account for the phenomena observed.

I had for many years attended the members of a family in which more than one of the females manifested symptoms of strumous taint, and one of them, upwards of forty years of age, was suffering from slowly progressive paralysis of one arm and leg of the same side. Various means had been employed to arrest or cure this, but without such an effect, and not unnaturally, she took it into her head to call upon and consult another physician, who at once ordered a mixture containing the bromide of potassium and the liquid extract of ergot. She became rapidly worse, and died a few days thereafter. (After meeting this physician in consultation, and pointing out to him that his prescription did not suit his patient, I found it my duty to retire, leaving her in his hands, but a day or two thereafter I was again asked to take charge of her, when I insisted upon calling in another consultant of experience, who unreservedly concurred with me in regard to the unsuitable nature of the prescription given.) That ere long she would have succumbed to her disease I have no doubt, but I have as little that the medicine precipitated this result. Or it may be stated thus, that, so far as we could judge, from the rate of progress of disease previously, she would probably have survived for some time longer had she not used the remedies ordered.

The above case occurred some years ago; and about the same time I was asked to see a lady, the mother of a family, and in age nearing the half-century, who then complained of the pains of general muscular rheumatism. The thought of giving iodide of potassium occurred to me, but as it was the cold season of the year (early spring), to avoid the risk of bringing on the coryza, &c., of iodism, I decided to substitute the bromide for it, although the iodide is considered the best anti-rheumatic agent. The dose was ten grains, three times a-day, or thirty grains per day, if I remember correctly, but I am quite certain that it was not more than twenty grains per dose. Unfortunately, I cannot now get the prescription used. The bromide was then used for a few days, but my patient became gradually so confused and stupid in look, in fact, bloated in aspect, so unsteady in gait, and unable to walk, that she fell in getting out of bed, and I could

not help indulging the suspicion of the vice of secret tippling, which I am now satisfied was a complete mistake. I did not then know that the bromide was capable of producing symptoms so much resembling those of general paralysis, but I began to suspect it as the cause of mischief, and at once discontinued it, when these alarming symptoms speedily disappeared, much to my relief, and under the use of a common bitter tonic, with acid, my patient speedily got well. It ought to be mentioned, also, that the secretions generally were deranged, the tongue became foul, loaded, and even black in the centre, and the bowels sluggish; the urine, however, remained clear.

More recently still, in fact, within the last few months, another case somewhat similar to the preceding came under my observation, in the person of a woman, also the mother of a family, but in age nearer to three-score, who had been ordered the bromide for pains in the legs and feet. The dose in this instance was ten grains, three times daily, after food. Symptoms precisely similar presented themselves in her case, though the degree of confusion and instability in limbs never was quite so great. Probably the dose was less, and the effect was noticed at an earlier period, and the bromide laid aside. After this was done, and under the use of tincture of *nux vomica* in moderate doses, these effects rapidly disappeared, and my patient is now much better than she has been for many months.

Besides other virtues which have been attributed to this salt, some of them certainly not proven, it has been credited with an anæsthetic effect upon tactile and sensibility generally, and especially upon the mucous membranes of the *velum palati*, the *pharynx*, *conjunctiva*, and *urethra*. When this condition is aggravated, as by a larger dose than usual, it is called bromic intoxication or bromism. This is characterised by insensibility of the skin, so great, that it may be pinched or pricked without the giving of pain; by great muscular weakness, and inability to stand, the patient having the tottering gait of drunkenness; by slight deafness and weakness of vision; by failure of memory, intellectual obtuseness, headache, and tendency to prolonged sleep. Doses, of two drachms and upwards, several times a-day, are named as likely to produce such conditions as are here noted; but the cases I have given, though shortly, are sufficient to convince me that much smaller quantities are sufficient to produce such unpleasant effects.

When we think of it in relation to paralysis, it might be presumed to be contra-indicated in cases having a tendency towards such a condition, and from what I have seen of it, it will not readily be ordered by me to any one whom I may suspect of incipient lesion of the brain or spinal cord. The theories promulgated with regard to its mode of action do not seem thoroughly satisfactory, and throw no light whatever in explanation of its therapeutic effects. It may be asked whether the age of these patients had anything to do with this exaltation of its usual action, and perhaps we

ought to regard it, as being less likely to prove injurious when given to the young. Though I have ordered it in much larger doses to such, no similar effects have been observed, or reported to me.

That this remedy is now largely used, and with justice considered one of the most valuable recent additions to the *Materia Medica*, may be adduced as a strong reason why such cases as I now present should be recorded, were it for no other purpose than to inculcate due consideration in the employment of such an active agent. Let me repeat also that, in this short communication, it was no part of my object to enumerate all the purposes to which it has been applied, or the uses it has been alleged to serve. A pharmacological writer, in a work very recently published, says—"Troublesome physiological results need not be feared from the administration of pure bromide of potassium," but he does not specify any impurity which would impair this innocent character thus ascribed to the salt, and we may assume that he has not witnessed such effects as I have noted.

The smallness of the doses deserves attention; they were smaller than those stated by writers, who give it a range of from five to sixty grains, and even larger doses, as a drachm and a half, or two drachms, are required in epileptic cases. Though the doses named in the "*British Pharmacopœia*" are intentionally, I believe for safety, under the average, yet the quantities used in these cases were far under the highest dose there stated, which is thirty grains, ranging upwards from five.

It seems to be admitted, though I cannot tell on what authority, that the ammonium bromide is not so apt to give rise to symptoms of bromic intoxication. For aught I know, this may be true, but I may remind you that its dose is stated lower than the potassium salt, namely, two to twenty grains, or more; how much more is not named. I have often ordered it in preference to the potassium salt, in doses of twelve grains, and sometimes double that amount, and it has so happened that, while I have seen the most marked benefit from it in epileptic and some other cases, in none have I met with symptoms disagreeable or even inconvenient. Still, I would not venture to use it in cases of progressive paralysis, or where any similar condition could fairly be apprehended.

3.—NOTE ON THE INTRODUCTION OF THE TUBE OF THE STOMACH PUMP AND NASAL TUBES, *by WILLIAM MACEWEN, M.D., Casualty Surgeon.*

THE directions given for the introduction of the tube of the stomach pump, in surgical text books, are for the most part very vague. Especially is this the case with regard to the position which the head should assume in relation to the trunk. Some omit to state the position, while others direct that *the head should be thrown well back*. One alone states that the head should first be thrown back, and then brought forward to alter the spinal projection.

Should the patient be conscious, he naturally withdraws his head and

throws it as far back as possible when the tickling, painful sensation is experienced as the tube of the stomach pump is attempted to be introduced; and should he be unconscious, the surgeon, following the ordinary directions, places his head well to the rear.

Acting upon this principle, considerable difficulty was experienced at the commencement of my practice, both in passing the nasal tubes and the tube of the stomach pump. Sometimes they did happen to pass in smoothly, sometimes a hitch occurred, to overcome which required several efforts. Once, after endeavouring for some time to introduce a nasal tube for the purpose of feeding a patient who was insensible from typhus fever, the nurse happened to move her arm, over which the patient's head was lying, in an upward direction, so as to bend the patient's head forward toward the chest, when the tube glided easily downward in the proper direction. This brought to my remembrance a patient in the Town's Hospital, six years previously, who was slowly recovering from cut-throat, the external aperture of the wound not being healed. He used to pass the tube of the stomach pump over his own pharynx in preference to allowing any other to do so, for the purpose of feeding himself. This man used to be taught, and the instructions reiterated by me, that were he going to pass the tube himself, he should keep his head well thrown back. Instead of doing so, however, he persevered in doing the opposite, and whenever he introduced the tube down went the head upon the breast. He always asserted that when his head was thrown backward, the tube did not go down right, and that then it hurt him.

On reflection, this seems perfectly natural. When the head is thrown backward, the spine becomes convex anteriorly; when it is bent forward an anterior concavity is formed. When a body directed horizontally strikes the upper segment of a convexity, it is deflected upwards. Therefore, the tube being introduced horizontally, and striking the upper segment of the convex surface presented by the spine, when the head is thrown backwards, would, other things being equal, tend to pass upward. Again, when a body strikes a convexity from above, but not at right angles, it is deflected along its surface in a downward direction, and then flies off at a tangent. So that when the tube is passed along the convex surface of the spine, in a downward direction, being semi-elastic, it applies itself to the curve, and ultimately passes off at a tangent, so as to impinge against the larynx. This explains the aptitude of the tube for entering the trachea.

But when a body strikes the upper segment of a concavity, in an oblique direction from above downwards, its direction is deflected, so as to follow the concave surface downwards; and more especially does it do so when the concavity is slightly parabolic. When the head is bent forward, the mouth, pharynx, and œsophagus form an approach to a parabolic curve, and the tube being directed toward the commencement of the upper arm of the parabola, on its inner side, glides gently into the œsophagus, and is at the same time directed away from the larynx.

Following this out in practice, I have never found any difficulty or hitch in introducing the tubes, either by the nose or mouth.

The danger of not recognising the mistake of passing the tube into the trachea, instead of into the œsophagus, is generally exaggerated. It may be easy for a tube of small calibre to pass into the trachea, and the grating sensation of the passage of this tube over the rings of the trachea may also escape notice; but unless this tube is of very limited circumference, it cannot go further than the bronchi, and so even the length of the tube able to be inserted may so far aid in the detection of the error. When the patient is conscious, the irritation is too great for him to bear, and the paroxysms of coughing can hardly be controlled. However unconscious, there is always a current of air passing into and out of the tube, synchronal with the heavings of the chest.

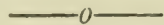
After the tube has been passed, its locality may be distinctly ascertained, should doubt remain as to its exact position, by blowing a current of air through the tube. When the tube is in the stomach, by approximating the ear to the epigastric region, toward its left border, either of two things is heard; should the stomach be empty, the air may be heard escaping from the tube after each stroke of the pump, and the epigastric region tends to become distended and tympanitic; should it contain fluid sufficient to cover the nozzle of the tube, an unmistakeable gurgling is heard. When the tube is in the trachea, and the dyspnœa and irritation should not sufficiently manifest themselves, by blowing a current of air through the tube the lungs become inflated, and as soon as the pressure is withdrawn, a corresponding expiration takes place. The greater the diameter of the tube, the more easily will this be effected, for if the calibre is very small, it is possible that the air might escape by the trachea without entering the lungs.

These precautions, however, can only be required in extreme cases, and also, probably, by the tyro. After a little practice, the feeling of the mucous membrane of the œsophagus communicated by the tube to the hand, is sufficient, in the greater number of cases, to enable the operator to determine whether he is in the correct passage.

Care should be taken not to introduce the tube too far, as, if pressed too far down, it is apt to injure the mucous membrane, and also to double up, so as to elevate its nozzle out of the fluid, and thus cause the operator to imagine that the stomach is empty. When it has been pressed too firmly against the stomach, ecchymosed spots are found on *post-mortem* examination.

Instead of forcing the mouth open, which is sometimes difficult in those who have attempted to commit suicide, and in the insane, it is much easier to introduce the nasal tube, and, when the head is thrown well forward, it is perfectly safe.

Reviews.



I.—THE SCIENCE AND ART OF SURGERY: Being a Treatise on Surgical Injuries, Diseases, and Operations. By JOHN ERIC ERICHSEN, *Senior Surgeon to University College Hospital, &c., &c., &c.* Sixth Edition, Enlarged and carefully Revised. 2 Volumes. London: Longmans, Green & Co. 1872.

WE have all experienced the annoyance of a vain search in some standard book of consultation for information which it was very necessary we should obtain, and that right speedily. So keen is often the sense of our disappointment that it awakens a feeling of unfriendliness towards the book, and distrust of its usefulness. It is therefore a matter of sincere gratification that as the resources of our art increase, as its cultivators propound new theories, and propose new practices, such friends as our "Erichsen" should be found growing in their ability to aid us by keeping abreast of the progress of improvement. It is not very long since the previous edition of this work was published, and yet in the present one we have evidences of a careful revision of all the old and many not unimportant additions to the new material of the book.

Many persons, we daresay, consult these volumes who have never taken occasion to read the introductory chapter on "General Considerations on Operations." It appears to us, short as it is, to touch upon points of great interest—points which must more and more engage the attention of all practical surgeons. We refer especially to what is there taught in regard to the conditions influencing the success of operations. It must be confessed this is a matter surgeons are inclined to study far too little. We operate upon all and sundry, and marvel at the great differences presented by their after-progress without very much taking to heart the lesson that we ought to endeavour to equalize our results by improving, if possible, the general health before operation, by trying to seize the best time for its performance, and by deferring indefinitely interference in cases where there is no danger to life or serious disturbance of comfort, if we see cause to apprehend unusual risk. If we find an intemperate man succumb under circumstances over which a temperate man's powers might have been expected to triumph, we are content to moralize on the evil effects of excess; again, if we meet

with unsuccess in the case of a patient "whose scanty diet has consisted of the refuse of the shops or the semi-decomposed offal of the stalls" where success might have reasonably been expected to follow had he been one "whose diet had been sufficient and of good quality," we are wont to shake our heads and call him "a bad subject;" again, if we find "one whose mind has been overstrained by the anxieties of business or the labours of a professional life," sinking in circumstances through which one "whose existence has been spent in rural occupations, and in the pure air of the country," would be carried securely, we are quite pleased to banish the occurrence from our minds with some such thought as is expressed in Cowper's lines,—

" Oh ! why are farmers made so coarse,
Or clergy made so fine ?
A kick that scarce would move a horse,
May kill a sound divine."

But such reflections will bring comfort to only the less thoughtful class of minds; who persist in regarding, because it suits them to regard the results as matters of course. In all cases of unsuccess—at all events occurring in operations of mere convenience—there is implied an unexpected disappointment; and this must be felt to be due to some form of mistake either in the operation, the after-treatment, or the conditions under which it was undertaken. What surgeon of standing has not had cause to lament the result of apparently trifling operations—the removal, it may be, of a small tumour, or the slitting up of an insignificant sinus? and the question will always arise in a conscientious mind, whether a better time for its performance might not have been chosen. It is true that much has of late been achieved by improved methods of after-treatment, and that we are nowadays, in consequence, more secured than formerly against untoward occurrences, but there still remains something to be done by more careful consideration of the circumstances before proceeding to operation, especially in cases where no urgency exists. We must operate in many cases without taking thought of such matters—as when we open a windpipe, remove a mangled limb, or relieve a strangulated hernia—but in many others, and notably in what Sir James Paget aptly calls "all measures of decorative surgery," we will do well to entertain such considerations, all the more so should our patients be intemperate, ill-fed, over-fed, over-fat, over-worked, very young, very old, plethoric, feeble, or the subjects of certain special diseases. We do not, how-

ever, mean to advocate over-refinement and fussiness; we have no wish to see surgical patients submitted to prolonged stethoscopic examinations of their chests, or minute chemical investigations of their urines; but neither do we believe it to be wise habitually to disregard such measures.

Immediately after this introductory chapter we are introduced to the subject of Amputations and Disarticulations. This part of the work is complete and well-illustrated; and with the directions for the different operations in the upper limb we have no great fault to find. But, on the whole, we are disappointed with the manner in which the subject is treated. The author lays considerable stress upon the necessity of planning incisions in amputating toes, with a view to avoiding future pressure on them; but the cicatrices of the incisions he gives for amputation of the great toe with part of its metatarsal bone, must, we fear, always so suffer. Besides, an undue amount of the tough skin covering its metatarso-phalangeal articulation is removed, and nothing is said of the *oblique* removal of the large cartilaginous head of the metatarsal bone.

We had occasion in the number of this *Journal*, for May, 1869 (page 394), to refer to the very erroneous account given of Syme's amputation at the ankle in the last edition of Mr Erichsen's book. We are glad to find that most misleading description no longer retained in its entirety. The incisions are now described in Mr Syme's own words; and we are, therefore, told that they are made *when the foot is held at a right angle to the leg*; but, unfortunately, Mr Erichsen, while improving the verbal account of the operation so far, has retained the very objectionable illustration, with the foot at anything but a right angle with the leg, and the incisions, consequently, very different from those laid down by Mr Syme. One would think it might have been worth while to make the illustration tally with the text. But if we read on we find that in the next paragraph Mr Erichsen retains part of the account given in the former edition. Thus he says—

“It is also of importance that the incision across the heel should be carried well back over its point. Unless this be done, a large cup-shaped flap will be left, in which blood and pus will accumulate, and the cicatrization of the stump will be much retarded.”

Now, this may be necessary when the incision is made from malleolus to malleolus, as Mr Erichsen used to direct; but can never be so when made from the tip of the external malleolus to a point exactly opposite it, while the foot is held at right angles to the leg, as we are directed in this edition to make it,

The whole description of the operation is confusing, and more so, perhaps, in this edition than in the previous one, by the very effort made to improve it. It seems as if some one of the gentlemen, to whom Mr Erichsen renders his thanks in the preface for assistance given in the preparation of this edition, had corrected the error in one part of the description of the operation, but had not felt warranted in making a complete and thorough alteration throughout it. The consequence is, that Mr Syme's rules are laid down in his own words in one paragraph, and widely departed from in the teaching of the next. Never was an amputation more minutely described by the deviser of it than this at the ankle in Mr Syme's own writings, and never has an amputation fared so ill in subsequent accounts of it by writers on surgery. The different methods of amputating in the leg and thigh are well described; but that through the knee, we think, might have received more attention. The last in the chapter, that of the hip-joint, is, perhaps, the best description of all.

The chapters on Inflammation and its consequences are altered both in arrangement and material. There is also added to them an excellent description of the antiseptic treatment of abscess, and an account of the transplantation of cuticle. In regard to the former, we may quote the following expression of opinion :—

“Of the great value of this method of treatment, more especially in the case of chronic and cold abscess, there can be no doubt in the mind of any one who has given it a fair trial. By the ‘antiseptic method’ properly carried out, and in accordance with a scrupulous attention to those details that are necessary for its successful employment, it will be found that the formation of pus speedily diminishes, that the danger of its decomposition is removed, and that the chance of constitutional irritation is consequently greatly lessened, if it be not entirely removed, that those dangers, in fact, which are apt to result from the opening up of large suppurating cavities are greatly obviated by the use of antiseptic dressings.”

It is noteworthy how often a correct idea of a mode of treatment is associated with an appreciation of its value, and, conversely, how frequently a dogmatic condemnation follows hard on the footsteps of a grossly inaccurate description; and it is always apt to be so where much depends, as in the case in point, on an attention to a multiplicity of little details. As careful and yet concise is the account of the treatment in regard to wounds at page 148.

It would be impossible in the space at our disposal to notice all the interesting material of these volumes; but this is the less required as the work is already well known to every one, and highly valued. We shall only, therefore, further

refer to one or two parts where new material has been introduced.

Dislocations of the hip have of late years become much more satisfactory subjects of treatment, thanks principally to our American cousins; for whereas, formerly, such injuries required for their reduction the cumbersome apparatus of pulleys and jack-towels, they are now with certainty remedied by means of a very simple manipulation. How great a difference alike to patient and surgeon within the last thirty or forty years! Let us quote the first few lines of Sir Astley Cooper's directions for the reduction of a dislocation on the dorsum ilii:—"Bleed the patient to twelve or twenty ounces or more, if he be a very strong man. Next place him in a warm bath at 100° , gradually increase it to 110° until he begins to feel faint. Whilst he is in the bath, give one grain of tartarized antimony until he feels nausea, then wrap him in a blanket and place him on a table between two strong posts into which two staples have been stuck," and so on. We forbear to quote the directions which follow of drawing the pulleys until the patient cries out with pain; then waiting until you fatigue his muscles, then pulling till he cries out again, then again waiting to fatigue his muscles; and lastly ending this sad eventful history by rotating slowly and suddenly relaxing all. This was done until success followed. Nowadays such a dislocation is reduced by giving a few whiffs of chloroform and performing an almost momentary manipulation, summarised by Bigelow in the following words, "Lift up, bend out, roll out." In this way we have ourselves reduced a dislocation on the dorsum of more than three weeks' standing in not more than as many minutes, and with the employment of not much more force than a child might exert. In this, as in much else, there is great ground for gratitude that we are "the heirs of all the ages, in the foremost ranks of time," whether we get our own hips dislocated or have to rectify the accident in others. Mr Erichsen's chapter on these matters, as might have been expected, has been largely added to, and will well repay a careful perusal by any one still unfamiliar with the subject. He has reproduced no less than nine illustrations from Bigelow's book on "The Hip;" and in other ways has drawn largely upon that most excellent work.

The subject of Spinal Concussion is one likely to attract increasing attention in these days of railway smashes and the development of tramways through our crowded cities. The public may be as familiar before long with its symptoms as with those of a sprained ankle. Meanwhile, however, even

most members of our profession may glean much valuable information in regard to the subject from the very extended treatment of it in the present edition by one who has a right to speak authoritatively on such matters. Two or three pages are added to the chapter on Diseases of the Hip-Joint, and devoted to an account of Sayers' and Adams' operations in ankylosis of that articulation. The text and the illustrations combined afford a very clear idea of the subject. Diseases of the jaws are also more fully treated, and one or two new and useful illustrations of the methods of excision are added.

A description of the trachea-tampon of Trendelenburg, of Berlin, and its mode of use is so interesting that we may quote a part of it. It is used "in cases of operation about the jaws, palate, and pharynx, in which danger might arise from the inspiration of blood into the air-passage:"—

"A trachea-tube, fitted with a hollow india-rubber collar, is then introduced, and the inhalation of the anæsthetic vapour carried on through it by attaching, by means of an india-rubber tube, a funnel containing a sponge. When the surgeon is about to commence his operation the collar is inflated, by means of the indiarubber ball attached, the effect being to close the larynx above the tube, and thus to cut off all possibility of blood finding its way down the larynx into the bronchi and air-cells. After the operation is completed, the 'trachea-tampon,' is removed, and an ordinary trachea-tube is substituted and retained as long as it may be thought necessary."

In conclusion, we may observe that the style of the writing throughout the work is pleasant and intelligible, though, perhaps, hardly so concise as might be desired in a book of consultation. There is also room for improvement by getting rid of such expressions as "operated patients" and "traumatic amputation," and by altering the grammatical construction of such sentences as the following:—"Wounds of the lung is the most common, and one of the most serious complications of injuries of the chest."

Our readers are aware how high an estimate has always been put upon Mr Erichsen's book in the past. Let us assure them that, high as that estimate was, they will find the present edition to merit it even more than its predecessors.

II.—HANDBOOK FOR MIDWIVES. By HENRY FLY SMITH, B.A., M.B., *Oxon* and *London*. London: Longmans. 1872.

ABOUT a year and a half ago, we had the pleasure of directing the attention of our readers to the "*Lehrbuch der Hebammen Kunst*," by Dr Schultze, of Jena, which shortly before had

reached its third edition. We expressed a high opinion of the value of that work, and threw out the idea that a translation for the use of English midwives would fill a blank in this branch of obstetric literature. The book before us is not indeed a translation of Professor Schultze's work, but the author states in his preface that "the scope of the book has been generally regulated" by the manual of the German professor, a statement which internal evidence confirms. It is a much smaller book, and in most of the divisions of the subject there is less minuteness and detail, but it is not on that account less likely to be useful to those for whose benefit it is written. The style is exceedingly clear and distinct, the descriptions accurate, and the directions judicious, and although we confess we have not met with a midwife or ladies' nurse who had acquired either in theory or practice such comprehensive and correct ideas regarding parturition as are presented in this manual, there is no reason why midwives should not attain to this standard of knowledge and even beyond it. In these days, when women are said to have little choice of employment, and when the female mind is aspiring to more responsible work, let a higher class of women study the art of midwifery upon a scientific basis. If there is any branch of the medical profession for which nature has intended them, surely it is this. The great majority of cases of birth would thrive just as well under their management, and in cases of difficulty or danger recourse might be had to superior skill.

In perusing this little book we have much to commend and little to criticise adversely, but we venture to question the propriety of one part of the directions regarding the management of natural labour. After the removal of the placenta (paragraph 144), the mother is left to rest for an hour, and after this hour's rest the binder is to be applied (paragraph 149). "The binder is not a preventive against 'flooding,' which depends on an uncontracted state of the womb; many do not use it at all," &c.

No doubt the flooding depends on an uncontracted state of the womb, but may not a properly applied pad and binder promote contraction or help to prevent the relaxing and consequent enlarging of the womb, which frequently takes place after partial contraction. That our author himself believes it may act thus is manifest in paragraph 175, on post-partum hæmorrhage, where the midwife is recommended to place a "heavy pin cushion or sand bag outside over the womb, and strain the binder." We would strongly recommend that the midwife be directed in all cases of natural labour to keep the womb grasped by the left hand, from the time of the birth of the child until

the after-birth is expelled, and then *immediately* apply a firm binder with a suitable pad. We are also in the habit of administering a dose of ergot whenever the after-birth is expelled from the womb. If this method of getting the womb contracted and keeping it contracted is properly carried out, post-partum hæmorrhage is an exceedingly rare event. That this practice is really successful in contracting the womb is further evidenced by the greatly diminished after pains, a matter of no small concern to the patient. The correctness of these observations has, we believe, been fully proved by extensive experience.

The Handbook is amply supplied with illustrations which are extremely accurate and well executed, and add greatly to its value. As a whole, this little work is highly meritorious, and well fitted to accomplish its special purpose. Indeed, the senior student and junior practitioner would find a glance over its pages profitable in many ways.

III.—A PRACTICAL TREATISE ON URINARY AND RENAL DISEASES, INCLUDING URINARY DEPOSITS. *By WILLIAM ROBERTS, M.D., Manchester. Second Edition, Revised and considerably Enlarged.* London: Smith, Elder & Co. 1872.

DR ROBERTS'S work has long been the favourite text-book on this subject in the Glasgow Medical School, and we are glad that, after having been out of print for a time, it can now be obtained with the advantages of further additions and careful revision. The present edition is about 100 pages larger than the last. Two new chapters have been added, one on suppression of urine, and another on paroxysmal hæmatinuria. A plate has been introduced to give precision to the definition of the various colours and tints of urine, and there are also several new woodcuts. Additions in the form of bibliographical references and of foot notes concerning recent researches may be noticed throughout, but no essential change has been made in the character of the book, and none in the main doctrines taught.

We notice that Dr Roberts adheres to the old formulæ for the chemical compounds found in the urine. This is perhaps excusable in a physician who has something else to do than follow the various changes of chemical notation and chemical doctrines; but as the new notation has been taught in this, and we presume many other medical schools, since about the date of his first edition in 1865, we are afraid that our students may feel as unfamiliar with the old formulæ as the author may with the new. It would have

been proper in a fresh edition to put at any rate the new alongside of the old. This, however, is no doubt a small matter in a book, the great object and characteristic of which is the clinical treatment of the subject. This method asserts itself throughout, and although pathological and other scientific questions are not neglected, the subject is so constantly treated from the clinical point of view as to give the work the practical character which has been so much appreciated by all.

The new chapter on suppression of urine from obstruction records some diagnoses made by Dr Roberts which may well be regarded with admiration. He insists very much on the difference in the quality of the small quantities of urine passed in *non obstructive* and *obstructive* suppression respectively. In the former (as in the scarlatinal form of acute Bright's disease) the urine is high coloured and concentrated; in the latter (as from the partial obstruction of the ureter by a calculus) the urine passed is pale and watery, and of a very low specific gravity. This peculiarity in the latter case he ascribes to the high pressure maintained in the pelvis of the kidney, which has been shown to affect the character of the secretion.

In the chapter on chylous urine, Dr Roberts has a new case which assists in throwing some light on the pathology of this affection, and it may be all the more interesting to our readers that the late Dr A. B. Buchanan published a case in the "Medico-Chirurgical Transactions" (Vol. XLVI), somewhat similar to that given by Dr Roberts in this new edition. In Dr Buchanan's case there was a chylous discharge from the cutaneous surface without chylous urine; in Dr Roberts's case the urinary secretion varied from time to time with reference to the chylous discharge from the abdominal surface, but on two occasions it presented the characters of chylous urine. He thinks the disease in both cases is essentially one of the lymphatics, and according as these varicose vessels rupture and discharge their contents externally, or in the course of the urinary tract, we may have a chylous discharge from the skin, or in the urine, or, as in the case now given, in both ways.

On the great subject of Bright's disease, the author adheres to his former system of keeping up this name. He divides the disease into the acute and chronic forms; under the chronic form he recognises three varieties—the smooth white kidney, the granular contracting kidney, and the lardaceous or waxy kidney. Dr Roberts evidently leans

strongly to the idea that these represent separate pathological changes, and although the large white kidney does sometimes suffer atrophic changes, and may at length dwindle to very small dimensions, he still holds that all contracted kidneys do not pass through the stage of enlargement. We would have expected to find in this new edition some fuller account of the changes observed in the retina in Bright's disease, but the short paragraph on this subject is exactly the same as that which appeared in the first edition.

Under the head of treatment in this grave disorder we do not find any novelty calling for comment. In particular we find no allusion to the treatment by the exclusive use of a diet of skimmed milk, advocated by another authority in the north of England. Some light may be obtained as to this omission from the evident disfavour with which he regards this treatment in diabetes. Dr Roberts's experience of this method has not been favourable. He says:—

"I have seen several patients who tried this severe method. Few of them could tolerate it except for a few days—and those who continued it longer were rapidly reduced. Three chronic cases I know of in which the treatment was obstinately persevered with died from exhaustion. One of them had been under my care for a considerable period, and maintained a fair state of health under a moderately restricted diet, and the use of opium—three months of the skimmed milk treatment brought the case to a fatal termination." p. 253.

Experience in Glasgow of the value of this treatment in diabetes has not yet, we think, been published, but, so far as we have heard, the opinion here is less unfavourable than that of Dr Roberts. We have heard even of some cures being reported from its use; and in the hands of several of the physicians at our Hospital, an exclusive diet of skimmed milk has been found to bring down in a remarkable manner the quantity and specific gravity of the urine, even although no permanent improvement may have been established. In one case in particular, so far from the patient being reduced, as Dr Roberts alleges in his cases, the weight of the body increased slightly from week to week. In this case, however, the patient consumed much larger quantities of milk than those named by Dr Roberts, and the craving of the stomach for more solid food seemed to be allayed by allowing him to take the milk in the form of curd twice a day, as suggested by Dr Donkin. Although this report by Dr Roberts of his experience is very unfavourable, we still look with some hope for further observations on the value of this treatment.

It would be out of place to review more fully a second edition of a work so well known and so highly appreciated as this, and so we have preferred simply to call attention to one or two points in which the present edition differs, or might be expected to differ, from the former.

IV.—COOPER'S DICTIONARY OF PRACTICAL SURGERY AND ENCYCLOPÆDIA OF SURGICAL SCIENCE. New Edition, brought down to the present date. By SAMUEL A. LANE. Vols. I. and II. London: Longmans. 1872.

THE voluminous work which has just been completed is well worthy of maintaining the eminent position which Cooper's Surgical Dictionary has enjoyed, since its first publication by its talented author in 1809.

The original text is taken as the framework of the present edition; but Mr Lane has found it necessary, from the progress which surgery has made since the last edition, to make extensive erasures, to supplement the original in some parts, and in others to have the articles entirely re-written. Besides this, there are a few articles added to this edition which had no place in the last. So that, out of above 2000 pages comprising the dictionary, there are 700 entirely new.

Mr Lane has associated with him in his arduous undertaking a number of gentlemen, among whom we find Erichsen, Thomson, Macleod, Druitt, Spencer Wells, Ancell, and many others whose names are well known to the profession, and sufficiently guarantee the standard of the work allotted to each.

Appended to each article there is an extensive, and in most cases an exhaustive bibliography with all the books or papers which have been written on the subject. What appears to have been aimed at is to give to the reader, first of all, the views of one eminently qualified, who has had favourable practical opportunities of forming an opinion, and who has made the question under consideration a special study. Secondly, to summarise the more important views which have been advanced, along with a brief statement of their value in current opinion. And lastly, to refer the reader for further information to the whole literature of the subject.

It is interesting to observe the advancements which have been made in surgery since the last edition was published. While investigations, embracing nearly every department of surgery, have been carried out in great variety, the most fertile fields, and those which have produced the best results,

are "Pathology," "Methods of Investigation," "Operative Surgery," and the "Treatment of Wounds." The first of these has been greatly advanced, by means of experimental physiology; and among those who have pursued the subject most earnestly we find the names of Syme, Paget, Lister, Flourens, Brown-Sequard.

The microscope, ophthalmoscope, laryngoscope, endoscope, have exposed new paths, and contributed much to our knowledge. The introduction of artificial anæsthesia has been one of the most signal advances in the resources of surgery. Syphilis has been elucidated by the researches of Ricord, though much remains to be determined as to the unicity or duality of the poison; and much more before the profession will believe in the rather dubious benefit supposed to be derived from syphilization.

There have been many experimental investigations into the subject of arresting hæmorrhage, and several substitutes for the old ligature have been introduced, but none of these have proved of so much value as the carbolised animal ligature, which, indeed, leaves little to be desired.

Conservative surgery has also advanced apace, and this, for the most part, has been forwarded by British surgeons. In gun-shot wounds, the results of conservative surgery have been very satisfactory. "Esmarck, Stromeyer, Langenbeck, Longmore, Macleod, Muir, Blenkins, Williamson, have rendered great service in this department of surgery. The success of our British surgeons in the Crimea was by far greater than those of the French."

One of the greatest advances in surgery has, undoubtedly, been made in the dressing of wounds. The antiseptic system has completely revolutionized the treatment of wounds. Having watched the development of the theory and its practice, step by step, from the first attempts with the carbolized blood, through the long list of experiments, up till the present time; and remembering the extreme dubiety with which it was regarded, even so lately as the meeting of the "British Medical Association" at Leeds, when it was hinted that it bore a strong flavour of empiricism: it is gratifying to find such passages as these—"The carbolic acid dressings of Mr Lister, of Glasgow, promise to render great service in preventing the suppurative and putrefactive changes in injured parts, and have already produced results justly characterised as 'astounding:'" and, under the heading "Wounds" (a long, exhaustive, and highly interesting treatise, by the Professor

of Surgery in Glasgow), the following passage, after describing the method of applying the antiseptic dressing—"That very much can be done by the careful development of this system of practice, and that much more may be expected of it than has even yet been accomplished, no one who has read Mr Lister's able papers can doubt."

Although we can no longer claim the results obtained daily in practice by antiseptics as "astounding," it is merely because repetition detracts from the marvellous. Yet, much requires to be done, especially in the treatment of amputations, which for the most part have not yet proved amenable to antiseptics.

Both volumes form one of the most complete and compendious works which have been issued in Surgery, and may be referred to with reliance as a mine of intrinsic value.

V.—THE PATHOLOGY, DIAGNOSIS AND TREATMENT OF DISEASES OF WOMEN.
By GRAILY HEWITT, M.D. Third Edition. London: Longmans, Green & Co. 1872.

CLINICAL LECTURES ON DISEASES PECULIAR TO WOMEN. *By* LOMBE ATTHILL, M.D. Second Edition. Dublin: Fannin & Co., Grafton St. 1872.

THIS ample volume, by Dr Graily Hewitt, with its numerous and beautiful woodcut illustrations, might tempt any one to interest himself in the subject, even though the reader should belong to that old school of practitioners who but hesitatingly admit the occasional usefulness of the speculum and uterine sound. In point of arrangement the present is superior to former editions. The natural history of the uterus and ovaries in health is followed by a series of descriptions illustrative of the pathological changes affecting these organs, and of their treatment respectively. Flexions and displacements of the uterus have a prominent place, for, according to the author's belief, they are the most fruitful source of ill-health, pain, and discomfort, not only by affecting the surrounding viscera, but by producing morbid changes in the structure of the uterus itself, such as congestions, abrasions, and ulcerations. In consistency with this view he has given the subject of uterine adjustment and support much study, and has invented or modified certain mechanical appliances, more especially the flexible ring pessary, which is here represented in its various forms, by drawings from photographs. The posture of the body he considers of much importance in rectifying abnormal conditions, thus:—

"The first point to be attended to in the treatment of retroflexion of the uterus is the position of the body. The patient should lie, not upon

the back, but upon the side, or, still better, upon the face. * * The result is that the weight of the fundus uteri is in a great degree thrown forwards instead of backwards, and great assistance in the mechanical treatment is thus afforded. * * The length of time during which it is necessary to maintain this position of the body depends upon the acuteness of the case. But where there is much irritation about the uterus it is absolutely necessary for the patient to remain in this position for some weeks."

And again, of anteversion and anteflexion of the uterus—"The first element in the treatment is the position of the body. The patient must be made to lie continually on the back, and bodily exertion must not be permitted." Of a certain much-disputed operation he thus speaks—"I am far from entertaining a belief that the incision of the cervix uteri is all-powerful in the treatment of dysmenorrhœa, but in a certain class of cases it is of great assistance, sometimes by itself, at other times as a basis for further measures." Most of the other usual means of relief are recorded throughout the volume, but they are evidently viewed by the author as secondary to the mechanical—for example, on *caustics* he remarks—

"Those who attach so great an importance to the so-called inflammatory affections of the os and cervix uteri, advocate the necessity for the assiduous employment of caustic agents in dealing with them. Neither the pathology nor the treatment inculcated in this work are in conformity with these views."

And again—

"These destructive operations on the os and cervix uteri are not, in my opinion, to be recommended. Nor have I seen cases in which the application of caustics to the upper part of the cervical canal, still less to the cavity of the uterus itself, appeared necessary or of utility."

In short, the key to Dr Graily Hewitt's plan of treatment is this—Let the uterus, if possible, be mechanically restored to its proper position and form, and be kept at perfect rest; and if other local and general appliances may aid in this primary object, let them be used. A method, which few would wish to controvert, provided those minor appliances are not cast too much into the shade, and so neglected, or, at least, used with a slack hand.

In Dr Atthill's little volume, while the mechanical aspects of the subject are by no means overlooked, there is clear testimony borne to the absolute necessity and signal efficacy of other auxiliaries. The first edition of these *Clinical Lectures* was reviewed in a former number of this *Journal* and our appreciation of their worth has not diminished, but much increased, since then. The general instructions they convey are free from all ambiguity, and there is a very satisfactory fulness of detail in regard to the various processes, clearly proving their

genuine character. His mode of introducing the uterine sound—concavity backwards—is a very easy one. Of cervical leucorrhœa he thus speaks:—

“The condition of the cervix giving origin to cervical leucorrhœa is one very difficult to cure; to do so, you must treat the whole extent of the cervical canal, and this can seldom be accomplished without dilating it to an extent sufficient to enable you to apply to its whole length a strong caustic, such as the fuming nitric acid, to which I give the preference above all others; the application of solution of nitrate of silver, and even of the solid nitrate itself, will seldom be sufficient.”

The author has had satisfactory results in mechanical dysmenorrhœa from the use of the metrotome. For sub-involution of the uterus with menorrhagia, he has followed with success a somewhat heroic method, first introduced by the late Sir James Simpson—namely, the introduction up to the fundus of the uterus, by means of Simpson’s Uterine Porte-caustique, of ten grains of the solid nitrate of silver, which is left to dissolve there. As to the seeming danger of this method, he remarks:—

“Although I have on several occasions seen callulitis follow on the use of astringent applications apparently more mild, as yet it has not occurred in my practice after the introduction of the solid nitrate of silver.”

This, however, must not be supposed to be the method adopted by him in all cases of sub-involution. For instance, where it depends upon an engorged condition of the uterus, he punctures and not merely scarifies the cervix with Dr Hall’s lancet-shaped knife, applies cotton wool soaked in glycerine, as first suggested by Dr Marion Sims in his valuable though eccentric treatise on uterine surgery, and administers internally, variously combined, such medicines as steel, strychnia, ergot, and gallic acid. The author has devised an ingenious adaptation of the canulæ of Gooch to the *écraseur*, so as to carry the steel wire over intra uterine tumours.

Attention is drawn to Dr Greenhalgh’s useful modification of ring pessaries for supporting the womb or rectifying malpositions; these are made of copper wire cased in India-rubber tubing, the wire, however, being awanting at one end, the India-rubber alone extending across that part, so as to adapt itself without undue pressure to the parts in front, especially the neck of the bladder, and, moreover, to permit of the sides being approximated during introduction. Dr Atthill’s treatise may in one aspect be viewed as a complement to that of Dr Graily Hewitt, the wider views and more general treatment of abnormal conditions, in the latter work, being supplemented by the numerous special appliances of the former, and both together constitute a most valuable addition to the obstetric library.

Clinical Record.

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I.—CASES FROM DR SCOTT ORR'S CLINIQUE.

Reported by CHARLES MACBRIDE, M.B.

1.—*Dissecting Aneurism of the Aorta—Rupture into the Pericardium.*

Wm. S., aged 31, night policeman, admitted 1st January, 1873, was engaged in his duties at Maryhill on the 28th December, (Saturday night) wheeling an inebriate on a barrow to the police office. Afterwards he went out, being a little heated, and came in on the Sunday morning at 2 A.M., complaining of violent pain in the chest over the cardiac region, and was said to have been exceedingly pale. He fell off a seat in the police office, and then rolled on the floor, from the severity of the pain. He was given a glass of brandy, but vomited it up immediately after. His bowels were stated to have been constipated. He was removed home, where he lay till 1st January, 1873. Still complained of the pain in the cardiac region, occurring in severe paroxysms.

On admission he was in a dying state, pulse almost imperceptible. The body was cold, face was flushed. The pupils were very much contracted. A catheter was passed, and about three or four ounces of urine drawn off, which gave a copious white precipitate when nitric acid was added. Shortly afterwards became very drowsy, and died within five hours.

Extract from Pathological Report by DR JOSEPH COATS.

Chest.—The pericardium is distended with a mixture of clots and fluid blood, which, on removal, are found to weigh about 3 lbs. The heart itself is considerably larger than normal, its walls, however, are not abnormally thick. The source of the hæmorrhage is found to be a *dissecting aneurism* of the aorta. On careful examination it is found to extend along the aorta from its origin down to the middle of the abdominal aorta. In the greater part of its course the external coat is separated from the middle for about the half of the circumference of the vessel, though at some parts to even a less extent. At the origin of the aorta, however, the separation is much greater, almost the entire circumference being involved. At this part too the external coat is more dilated than elsewhere, so as to form a distinct bulging tumour within the pericardium. On the left lateral aspect of this prominence there is a transverse tear about half an inch in length, which, however, is closed with clots, and does not present a very striking appearance. Throughout the greater part of its course the wall of the aneurism is comparatively thin, and to the appearance does not much exceed the ordinary thickness of the external coat. Its internal wall is

somewhat striated in a direction parallel to the circumference of the vessel, and the external surface of the aorta is striated in a similar direction. These markings, depending on the circular fibre of the middle coat, show that the separation is in part through the middle coat, and not simply a dissection of the external coat up from the wall of the artery. The aorta also presents a marked tendency to tear in a circular direction. It should also be noted that the aneurism stops suddenly short at the point mentioned above, its lower extremity not tapering, but ending with a broad point, where the external coat again adheres to the middle. Except at the first part of the arch, no communication between the vessel and the aneurism is discovered; but here there is a sufficiently large one. This aperture is formed by two limbs, a short transverse and a longer longitudinal, so that the wall of the artery here forms two triangular flaps. The transverse limb has smooth margins, is about half an inch in length, and situated about half an inch to an inch and a-half above the valve on the anterior wall of the aorta. The longitudinal limb which projects obliquely downwards from the transverse is three-quarters of an inch in length, and has very irregular margins, and presents all the appearance of a recent tear. It is also to be noted that this aperture is nearly opposite the rupture in the external wall of the aneurisms. The wall of the aorta elsewhere is generally normal, but just opposite the aperture there is a distinct depression with comparatively abrupt walls. The aorta and other valves are normal. The lungs are normal.

2.—*Case of Pleuro-Pneumonia, ending in Thoracic Abscess opening externally*
—*Recovery.*

Alex. S., aged 29, joiner, admitted 26th October, 1872, suffering from dyspnœa, cough, and expectoration of eight days' standing. The illness commenced with pain at the lower and posterior part of the left lung, followed by cough and dyspnœa, and on the second day the sputa were of a rusty colour. The pain extended gradually to front of left side, and decubitus on that side increased the pain. Percussion on this side from nipple in front to left lateral region and lower half of lung behind, was quite dull, with strong bronchial breathing, and fine crepitation. The pulse 112, tongue furred, skin hot, appetite pretty good, and bowels regular. This man had rheumatic fever five years previously, and had been subject occasionally to epistaxis. Previous to his admission he had been blistered, and the severity of the disease seemed much abated. Iodide of potassium, in five grain doses, was administered to him three times a-day. His progress at first towards recovery appeared to be satisfactory, but gradually great debility ensued, with profuse sweating, and great increase in the expectoration, which assumed a distinctly purulent character. There was also extension of the dull percussion as high nearly as the left clavicle. He, however, always took his food and wine well, was in

good spirits, and hopeful. About six weeks after his admission an abscess was discovered pointing under the left nipple, exceedingly tender to the touch, which, after being allowed to mature for ten days longer, was opened antiseptically on the 16th December. About an ounce of pus escaped, and this seemed to ebb and flow with each respiratory act. The relief experienced from the evacuation of this abscess was at once apparent. From the day that it was opened the cough, expectoration, and sweating steadily diminished, and at last entirely disappeared, his health and strength improved, and he was discharged quite cured on the 16th of January, 1873.

[*Remarks by Dr Scott Orr*.:—In many cases of thoracic abscess opening externally, as in this instance, it is difficult to say whether the pus comes from the tissue of the lung or from the cavity of the pleura. The copious purulent expectoration which existed from a comparatively early period in the history of the case rendered it pretty certain that the lung was implicated, and that suppuration of a part of its substance had taken place. The case is not by any means an uncommon one, but it is remarkable for the very complete and rapid recovery the patient made, after a tedious illness, so soon as the abscess was opened. It affords a very interesting counterpart to a case which I related in the June number of this *Journal* for the year 1866, where a simple superficial abscess of the thoracic parietes occurred in a perfectly healthy man, who had never had any grievous chest complaint. This abscess penetrated the chest, and discharged itself through the bronchi, and, although pointing in the axilla, the pressure of a properly applied compress was sufficient to cause its disappearance, and, as a result, the patient's complete restoration to health.]

112—LIGATURE OF THE FEMORAL ARTERY AT THE APEX OF SCARPA'S TRIANGLE, ON THE "ANTISEPTIC" SYSTEM, FOR THE CURE OF POPLITEAL ANEURISM.

Reported by WILLIAM MACEWEN, M.D.

On the 23rd September, 1872, during the illness of Dr Robertson, I was asked to see a man in the Town's Hospital, who was suffering from popliteal aneurism.

History.—His history may be briefly stated as follows:—Immediately before admission into the hospital, he was occupied as a labourer, but had previously been a soldier, and was dismissed from the service on account of heart disease. He had had ague and syphilis; the usual appearances which characterise the advanced stage of the latter disease were present in the form of indurated glands, discolouration of skin, cicatricial spots, the marks of previous eruptions. Seven weeks previous he felt a severe pain in the right popliteal space, which presented, on examination, a small tumour.

From this time forward it increased rapidly in size, and gave very acute pain, and prevented him from sleeping.

Examination.—He was a man of 40 years of age, with a sallow, anxious expression of countenance; of a robust build, but rather emaciated. Several days prior to this, a slight mitral murmur had been detected; but after a very careful examination of the heart, the sounds and rhythm were found quite normal. This slight murmur may be ascribed to some functional cause. The whole arterial system was scrutinized; but though the arteries generally were not so elastic to the touch as they are in health, yet there was no other aneurism detected than that of the right popliteal.

The right leg was kept by the patient slightly flexed at the knee. A circumscribed tumour, which manifested distensile and excentric pulsations, synchronous with the pulse, occupied the whole of the popliteal space, and bulged on either side of it. The skin over the tumour was livid, and in some parts considerably thinned, so that the arterial wall was felt in close approximation to the finger. The walls of the aneurism itself were thin and very elastic. Pressure on the femoral artery completely stopped the pulsations of the tumour. The limb below the tumour was swollen and tumid, and slightly livid. The sensation was completely gone, and the mobility, as far as the lower parts of the limb were concerned, was lost. There were shooting pains passing upwards and downwards from the tumour, which kept him in agony; and he stated that he had not slept for five nights previous to this time. The measurements of the two limbs, at corresponding parts, were as follows:—

| | Diseased Limb. Inches. | Sound Limb. Inches. |
|---------------------------------------|---------------------------|------------------------|
| Round knee over centre of patella, | 18 $\frac{1}{8}$ | 14 |
| Three inches above centre of patella, | 16 $\frac{1}{2}$ | 13 $\frac{5}{8}$ |
| Three inches below centre of patella, | 15 | 11 |
| Round the calf, | 14 $\frac{2}{8}$ | 12 |

For several days previous to this, pressure and flexion had a very full trial, under the careful management of Dr Morrison (Dr Robertson's assistant), without any beneficial result. Seeing the state of the parts, it was advised that operation should be proceeded with at once.

Accordingly, on the 24th September, with the assistance of Dr Allan (now of Belfort Hospital) and Mr Carr (one of Dr Robertson's assistants) the femoral was ligatured with antiseptic cat-gut, at the apex of Scarpa triangle. The operation was performed with antiseptic precaution, and the wound stitched with antiseptic cat-gut, and dressed with lac plaster. The whole limb was enveloped in a layer of cotton wool.

The next day he felt relieved of the great pain which he had previously experienced, and had slept during the night.

On the eighth day after the operation, the wound was in great measure healed; the upper portions of the sutures were lying on the surface detached, while the parts that had been in the tissues were absorbed.

There was no inflammation, and no pus at any time. The man slept soundly, and his appetite was vigorous. He never complained of pain in the part, and his pulse averaged 82.

On 8th October, the edges of the wound were found to have partially separated, probably from some undue movement of the patient, but this was soon cicatrised over.

The limb below the tumour began slowly to recover its sensation; the tumescence lessened; but the nervous power of the toes, and the outside of the foot, remain still very much impaired, and one or two sloughs formed.

The tumour gradually became much firmer, and began to diminish in size. The measurements taken on Oct. 25, 1872, were:—On the patella, 16 inches; three inches above patella, 13½ inches; three inches below patella, 14 inches; round calf, 13 inches.

III.—CASE OF LYMPHATIC LEUCOCYTHÆMIA.

Under the care of DR M'CALL ANDERSON.

Reported by BLACK MORRISON, M.B., C.M., House Physician.

M. R., æt. 23 years, unmarried, a wood-wright, was admitted into Glasgow Royal Infirmary on Nov. 28th, 1872, suffering from extreme prostration in association with œdema of the lower extremities, scrotum, and abdominal parietes. Patient has a care-worn, anxious expression, and his features resemble those of a more elderly person. He is of very excitable temperament, and peculiarly nervous. The entire surface of the body is dingy and dirty-looking, with here and there, but especially about the neck and shoulders, a mottled discolouration of the integument, contrasting with the conspicuously anæmic condition of the patient, who resembles one exhausted by hæmorrhage. There also exists an intensely troublesome pruriginoid eruption, most observable at the posterior cervical region, between the shoulders, and along the insides of the thighs. The cervical, axillary, inguinal, and femoral glands are much enlarged, and markedly indurated, and some of them, particularly several in the axillary and lateral cervical regions, are larger than a plum. No history of syphilis can be made out, and no evidences of it are discernible. There is unmistakeable dyspnœa. Respirations, 24. Pulse, 130; weak, compressible, and with an occasional jerk. Temperature, 101·4°. Tongue clean and moist. Bowels tend towards constipation. The specific gravity of the urine is 1026: it contains no albumen, and the daily quantity is about normal. Upon percussion no abnormal precordial dulness is detected, and the cardiac sounds are natural, but weak. Good percussion notes are elicited at the pulmonary apices and bases, but bronchitic râles are heard all over the lungs, dry in character above, and partaking of moisture at the bases. No alteration in size of either the liver or spleen can be made out.

This patient is rapidly becoming very emaciated. His appetite remains

good, but capricious, while his thirst is great. He is continually drowsy; his breathing during sleep is almost stertorous; he is easily roused; and is little refreshed by rest. While asleep he is repeatedly observed to be scratching and tearing his skin, and this he persistently perseveres in while awake, though quite unconscious of the act.

He states that he has always been very regular and temperate in his habits. While a child he was weakly, suffered much from diarrhœa, had hooping-cough and measles, laboured frequently under bronchitis, and nine years ago was confined to bed during a month with an attack of "inflammation of the side," regarding which, however, no reliable or satisfactory information can be obtained. He believes his present illness became established about two years ago, inasmuch as at this time he contracted a severe cold, accompanied by violent cough, from which, nevertheless, he rapidly recovered. Shortly afterwards he was seized with severe pain in the left hip, gradually extending down the posterior aspect of the thigh and leg to the heel. He describes his suffering from this to have been of the most excruciating character, occurring in paroxysms, and notably periodic. Several antiperiodic agents were employed in the hope of affording relief, but were of no service. The other limb soon became similarly affected, and one evening, about eighteen months ago, after indulging somewhat freely in alcoholic stimulants, a sudden exacerbation of the pain induced fainting, and since then he has found it invariably aggravated upon partaking of them. Four months ago this pain suddenly ceased, and has never recurred. The cutaneous eruption appeared about the same time as the increase in the severity of the pain in the thighs, and six months ago the axillary glands began to swell, and subsequently those in the neck and groins. During the summer of last year, while residing at the west coast, he first became aware of the existence of œdema about his ankles, which was always more decided at night, and at the same time the quantity of urine very perceptibly diminished.

His family history is good.

Microscopical examination of blood drawn from the finger-tip reveals a great increase in the number of the white blood corpuscles. Treatment—Nourishing diet, with one pint of porter to dinner. To have a hypodermic injection of quarter of a grain of morphia every night; and to take the following pills daily:—

R Ferri Sulphatis,
Potassæ Carbonatis,
,, Tartratis, æ ʒss.
Tragacanth. q.s.

M.

Divide in pil. 96.
Sig. Six pills daily.

December 5th.—To have one-thirtieth of a grain of phosphorus in a teaspoonful of codliver oil thrice daily.

December 9th.—Patient complains much of the morphia increasing the drowsiness, and occasionally headaches. Hypodermic injections omitted, and thirty drops of chlorodyne substituted.

December 10th.—Last night the cedema of the scrotum was found to have increased enormously, and this morning it was pricked in several parts, elevated and fomented. From this time the weakness rapidly increased, and the respiration became extremely laboured.

Dec. 11th., 3 A.M.—Unconscious; breathing stertorous. Death at 5 o'clock A. M. *Post-mortem* examination refused.

IV.—CASE OF POISONING FROM CARBOLIC ACID.

Reported by W. SNEDDON, M.B., Beith.

Was called hurriedly on the morning of Friday, 13th September, 1872, about 9 o'clock A.M., to see a servant woman who was found dead in a room, off the kitchen, where she slept.

Before going into the room, I asked the lady of the house if she suspected the cause of death. She replied that she thought the girl had burst a blood vessel, but that on looking around she found a bottle containing a fluid labelled, "Carbolic Acid. Poison."

On entering the room where the body was lying, there was a decided odour of carbolic acid, which was not so appreciable in the kitchen. Before disturbing the position of the body, I found there was neither pulsation at the wrists, nor over precordium; but as the body was quite warm, I considered death had only occurred a short time previously.

The body was lying on the dorsum on the floor in the corner of the room, but was twisted from right to left, so that the face and upper part of body were resting on the right side, with the head in the corner. The head was slightly flexed on the body, the thighs extremely so, with the legs flexed on thighs. The body was dressed with night dress and cap. Face was livid, and had an expression of suffering; lips were livid and very much swollen, so that they pouted, and there was frothy, sanious mucus in mouth. Nostrils were distended, and there was blood oozing from them. The mucous membrane on inside of lips and on the tongue was blanched, and tongue seemed to be swollen. There was blood on the arms, dress, and on each side of the floor, which smelled distinctly of carbolic acid.

Beside the bottle which was on the window-sill of the kitchen, there was some blood, which had been wiped up by the lady of the house before she discovered the servant in the room. At first the lady thought the servant had gone to the washing-house, and it was only after having gone out to see, that she thought of going into the room. After seeing the blood in the room she remembered she had wiped up something red on the window-sill, which, on examination, was found to be blood.

The fluid must have been drunk from the bottle, for no vessel could be found smelling of carbolic acid. It was a 6 oz. transparent bottle, which had been left half empty about a year previously, and which only contained about one ounce now. The original strength of the fluid could not be discovered, but that which was left was a watery solution of carbolic acid in the proportion of 1 to 4, so that she must have taken about half an ounce of the acid.

She was seen in bed by her mistress the previous night, who was in the habit of going into the kitchen at bed time to turn off the gas, as the meter was there.

The bottle containing the acid was kept on the highest shelf of a press in the parlour, which is on the opposite side of lobby from kitchen. The parlour door was locked that night, as was always the custom—the key being left in the door. The blind was down at bed-time. On the following morning the door of the room was open, and the blinds in the room and kitchen were up; the gas was still turned off, and there were no other lights—so that, from this corroborative evidence, I concluded it must have been taken early in the morning, not sooner than 5 A.M., and death must have resulted within three and a-half hours after taking it.

There was a *post-mortem* examination on the following day, made by Dr Paxton of Kilmarnock and myself, with the following result:—

M— W—, aet. 22 years, domestic servant. The external aspect of body is natural, and no marks of violence are observed. There has been some oozing of blood from nose and mouth. On opening the head there is found considerable congestion of the blood-vessels of the dura matter, also of the brain, but the brain structure is healthy.

The mucous membrane lining the lips and covering the tongue has a pale sodden aspect, and the tongue is swollen. The lungs are found excessively congested, some parts being almost hepatized. Heart is quite normal. On removing the trachea the epiglottis and other parts forming the orifice of the windpipe are swollen and thickened; the mucous membrane lining the trachea is red and congested.

On opening the abdomen, there was a distinct smell of carbolic acid. The stomach is full of a brown, grumous fluid, which gives off a strong odour of carbolic acid; its mucous membrane is intensely inflamed, especially at the pyloric orifice, and it is corrugated into long streaks of a brownish colour at intervals of an inch. There was no congestion of mucous membrane of gullet. The liver is congested, but healthy in structure. Uterus is healthy, and unimpregnated. All the other viscera are in a normal condition.

[*Remarks.*—This is another illustration of the direct irritant effects on the lungs of a known poison in the blood. Carbolic acid seems to have a special tendency to produce such effects, as was pointed out in remarks appended to a previous case reported by Dr Tennent in this *Journal*, Vol. III., p. 74. The chief interest, however, of these facts is the analogy existing

between pneumonia so caused and the pulmonary complications which are apt to arise in the course of such blood-poisoning diseases as typhus, enteric fever, scarlet fever, &c.—*J. B. R.*]

●.—SUCCESSFUL CASE OF TRANSFUSION.

Under the Care of F. E. CAREY, Esq., M.D., Guernsey.

Reported by JOHN AITMAN, M.B.

On the 28th of January, 1872, Mrs V. was seized with the early pains of labour, which continued during the remainder of the day. On the morning of the 29th, the head entered the cavity of the pelvis, though the pains were so slight that they could scarcely be said to manifest the characteristics of the second stage. Even these, however, ceased, and the progress became absolutely *nil*. The patient being irritable and much exhausted, in the afternoon an opiate was given, but no sleep followed, and at 10 P.M. the head occupied the same position it had done fifteen hours previously.

The patient was a primipara of an indolent disposition, and tending to obesity. About two months previously she had suffered from an attack of pleuro-pneumonia on the right side, and a fortnight later from a similar attack on the left side. Her sister states that since that date she has been unusually drowsy, dosing at all times when not actively employed. There has been no swelling of the feet. This drowsiness has not been so marked within the last few days as previously. The urine was not examined.

At 10 p.m. the head occupied the right oblique diameter of the pelvic cavity, but no fontanelle could be felt. A large caput succedaneum had formed, and the lower part of the vagina and labia were oedematous. An attempt to deliver with forceps having failed, delivery was accomplished with difficulty by version at 12.5 a.m. on the 30th. The child was still-born, but was resuscitated by insufflation. The uterus at first contracted, but soon relaxed, and a quantity of air was sucked into the cavity. Hæmorrhage came on with increasing intensity, in spite of all efforts to control it. Pressure on the abdominal aorta at last partly succeeded, but the patient had fallen into a state of syncope, and moist râles were audible all over the chest, even at a distance from the bed. Under these circumstances transfusion was performed.

An ordinary glass male syringe, holding about an ounce and a half, was procured, and a friend having been found willing to give the necessary blood, the operation was commenced. The blood was drawn into a warmed wine-glass, taken up in the syringe, and steadily injected into one of the veins at the bend of the elbow, which had been opened for the purpose. This was four times repeated, and (allowing for blood lost by clotting) about four ounces were injected. The effect was instantaneous; the patient

revived, looked about her, and in a few minutes spoke. The pulse, before imperceptible, reappeared, and the râles subsided. She had 20 min. tinct. opii and brandy, and by half-past three was so well that we left her.

Jan. 30th, 8 a.m.—Has been quiet, but has not slept. Had brandy repeatedly. Pulse 140, steady; respiration 28, variable.

9 p.m.—Pulse 124; respiration 28, steady.

31st, 11 a.m.—Pulse 128. A little excited, but feels well, and hungry.

6 p.m.—Patient suddenly seized with dyspnoea. Moist râles all over chest; face livid; extremities cold. —Pulse 134; respiration 42. To have tinct. opii min. 10 every four hours, and brandy.

Feb. 1st.—Better this morning. Pulse 128; respiration 32, quiet. It is supposed that the death of her child yesterday afternoon may have had some connection with her seizure.

2nd.—Quiet and comfortable since last night. Bowels moved yesterday by castor oil. Pulse 120; respirations 32. Wound in arm healed.

After this date, with the exception of a wild expression, which she constantly wore, and of occasionally giving way to bursts of emotion, she progressed favourably, until

Feb. 8th, when the pulse began to rise, and she showed unmistakeable signs of sinking. She refused food, and became quite unreasonable. Pulse 126; respiration 34.

9th.—Patient rapidly sinking; reason quite gone. Pulse 120, intermittent, feeble; respirations uncountable. Has lost control of the sphincters.

4 p.m.—Died, eleven days after operation.

[*Remarks.*—Transfusion is one of those operations which we are but seldom called upon to perform in the course of obstetric practice. When, however, the necessity does arise, it is all the more apt to find us unprepared; and as that necessity is always urgent, it is our duty to be aware of the most readily procurable instruments with which it can be performed. In the preceding case the operation was performed with, what I do not hesitate to call, success, with instruments found in the ordinary domestic laboratory. A common glass syringe and a wine glass can almost always be obtained. We found the size mentioned very convenient, as containing just about the quantity which could be injected before clotting interfered seriously with its action. The blood was not drawn into the wine glass until the moment it was required, and the glass was washed in warm water between times. A glass syringe, by its transparency, gives us the most perfect assurance that we exclude all air—a point of the most vital importance.—

[REDACTED.]

Glasgow Med. Journal

Exchange Journals.

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By JOSEPH COATS, M.D., *Lecturer on Pathology in Glasgow University, and Pathologist to Glasgow Royal Infirmary.*

VIRCHOW'S ARCHIV.

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XIV. Inflammation of the Cornea (*Axel Key & Wallis*).—This paper is apparently a very careful contribution to the much discussed question of the origin of pus corpuscles, and inflammatory cells generally. Norris and Stricker (and Sanderson follows them in his article on Inflammation in Hölue's surgery) have contradicted Cohnheim's original assertion that the cornea-corpuscles are unconcerned in inflammation, and that the numerous contractile cells which appear in the cornea come from without. These authors assert, on the contrary, that the cornea-corpuscles are primarily involved, and that most of the pus corpuscles which are found have these for their source. The authors of the present paper, on the other hand, confirm Cohnheim's observations. They made their experiments on winter frogs, where the processes are much slower, and hence more easily observed than in spring and summer frogs, such as were used by Stricker and Norris. They find that when the cornea is irritated with nitrate of silver the corpuscles, for a certain distance around, degenerate, this being chiefly manifested by the appearance in them of vacuoles, which develop mostly in the nuclei. The formation of this so-called "vacuole-zone" is the direct result of the action of the nitrate of silver, and is not properly one of the phenomena of inflammation, as it does not occur when mechanical irritation is resorted to, by a thread passed through the eye-ball, for instance. Except within this vacuole-zone, the cornea-corpuscles were always normal. All the contractile cells appeared first at the periphery of the cornea, and wandered into its substance from without, tending to accumulate in the neighbourhood of the irritated part. The wander-cells were of very various sizes, the largest being even ten times as large as the smallest. They contained one or several nuclei. The authors saw a large one divide while in the field of the microscope. The protoplasm masses of Stricker and Norris, which they supposed to be derived from the cornea-corpuscles, are only large wander-cells; they are never formed from the cornea-corpuscles, although they may be deceptively near. The paper is illustrated by eleven very excellent microscopic drawings.

XVI. Nephritis Diphtheritica (*Letzerich*).—The author of this paper is one of the strongest supporters of the theory, that diphtheria is dependent on the existence of a specific fungus. He believes that the fungus may find its way from the affected mucous membrane into the circulation, and thence into the kidneys, where it may lead to inflammation of the renal tissue. In experiments on rabbits he has succeeded in producing nephritis, by giving these animals the diphtheritic fungus in their food. He has also observed the case of a child who died of diphtheria, in which there had been suppression of urine, and in which after death abundant fungoid structures were found in the urinary tubules. He supposes that the fungus first develops and grows in the Malpighian capsules and convoluted tubules of the kidneys, but that it ultimately grows into the pyramidal tubules. When once the fungus has collected in such quantity as to render the tubules physiologically inactive, and when therefore there is no stream of urine, then the spores of the fungus accumulate in enormous numbers in the straight tubules. The paper is illustrated by some sketches showing the fungus in the tubules.

XIX. Hereditary Syphilitic Affection of the Bones (*Waldeyer and Köbner*).—This paper is chiefly confirmatory of the facts recorded by Wegner in Vol. L. of the Archiv (see this *Journal*, Nov. 1870, p. 126). In all cases of congenital syphilis the changes there described were present. In some cases where little was to be seen with the naked eye, yet under the microscope the changes were obvious. The chief of the changes were these two:—(1) very great proliferation of the cartilage cells at the

ossifying border of the long bones, the proliferation leading to a tissue composed of badly-formed granulation cells; (2) the peculiarity of the contents of the large medullary spaces just within the ossifying border. These spaces, which are bounded by the newly formed bony lamellæ, did not contain the usual lymphoid tissue with myeloid cells, but were filled with the same badly-formed granulation-tissue.

XX. The Gastric Juice of Fevered and Acute Anæmic Animals (*Manassein*). These experiments were made on animals, some of which were rendered pyretic by the injection into their vessels of decomposing animal matter, and others rendered anæmic by bleeding. It was first determined that the natural gastric juice of sound animals digests a considerable amount of fibrine or of albumen, and that the addition of an acid to the juice has either no effect on its digestive power, or a deleterious one. In acutely anæmic animals, on the other hand, it was found that the natural gastric juice (obtained by fistula from the stomach) digested in every case much worse than that of sound animals, but that the addition of an acid made digestion distinctly more active. In pyretic animals also the natural gastric juice digested much less than that from sound animals, and here too the addition of an acid increased its powers. It therefore appears that in pyretic and acutely anæmic animals the acid in the gastric juice is less in proportion to the pepsine than in sound animals. It is suggested by the author that in this fact of the deficiency of acid in the gastric juice of fevered animals, may be found the rationale of the old treatment of fevers by acids. The fact is also of interest, from the observation that though the natural gastric juice is deficient in acid, yet that artificial juice, obtained in the usual way by infusion of the mucous membrane of the stomach, is not deficient in acid, and digests much better than that naturally secreted. This applies to both pyretic and anæmic animals, but a difference was found in the powers of the gastric juice of these two respectively in digesting fibrine on the one hand or albumen on the other. It was found that while in acutely anæmic animals the artificial juice digested fibrine as well as that from sound animals, yet that albumen was somewhat worse digested. On the other hand the artificial juice from pyretic animals digested fibrine even better than that of sound animals, and albumen not worse.

XXIII. Source of the Exudation Cells in Pneumonia (*Koster*).—The author of this paper has met with a case, which may have some important bearings on the much-discussed question of the origin of the cells in inflammation. The case was one of so-called brown induration in the lung, in which an acute localized pneumonia had supervened. In brown induration we have thickening of the interstitial tissue of the lungs, with deposition in the connective tissue cells of a brown granular pigment. There is thus a natural pigmentation of the connective tissue cells, and if any other cells are derived from them, we should expect these also to be in great part pigmented. On microscopic examination, then, it was found, that while the uninflamed lung-tissue presented more or less the pigmentation referred to, it had almost entirely disappeared from the inflamed part. On the other hand, the exudation within the lung alveoli contained abundant cells, in which the same brown pigment was present in large quantity. From this observation the conclusion seems authorised, that by the inflammation the fixed connective tissue cells are so altered, that either themselves or their descendants are made capable of wandering from the walls into the cavities of the alveoli, carrying in this case their pigment along with them. This observation is of the more importance, as here we have performed by nature an experiment which has been attempted artificially with very partial

success. An attempt has been made by the injection of vermilion and other pigments into the body of animals to obtain the deposition in the connective-tissue cells of a granular pigment, so that on inducing inflammation the new-formed cells may be recognized. But here we have both the processes performed by nature, and we are thus freed from the fallacies of artificially produced conditions.

XXVIII. Regeneration of Divided Nerves (*Benecke*).—A good deal has of late been written on the process of regeneration after the division of nerves, and the present paper is principally confirmatory of previous observations, but possesses considerable merit as going carefully over the subject by experimentation.

XXIX. A Method to determine the Occurrence of Death (*Magnus*).—The following simple method, which can be used equally well by medical men or others, has been devised by the author as a convenient means of determining the actual fact of the existence of death. "If a member of the body, preferably the finger, be ligatured with a strong thread very tightly, then in a living person there soon shows itself a reddening of the ligatured member. At first the part becomes slightly red, but the tint gets continuously darker and deeper, till it passes over into a bluish red; the member is homogeneously coloured from the tip down to the point of ligature, at which, however, there is a pale ring." If in any case the finger is unsuited for this test, as where the epidermis is so thick and horny as to interfere with the colour, then the toe may be used; or if neither is suitable, the lobe of the ear. The author has tried this method on numerous occasions, and has always found that in the living the action is given, but never in the dead, even though death had been of recent occurrence.

XXX. 4. Treatment of Prolapsus Uteri (*Andreef*).—The treatment recommended in this paper, and which has been successful in several cases described by the author, is the local application of a tincture of iodine. He was induced to try this method by observing that in certain cases iodine locally applied had an effect on the ligaments of the uterus, causing them to pass from a relaxed into a normally firm state. His directions for carrying out the treatment are chiefly the following:—Before beginning the treatment, all other diseases of the uterus should, as far as possible, be removed, because the iodine, acting, for instance, on ulcerated surfaces, is apt to induce serious inflammation. Previous to the operation, the uterus should be replaced, and the patient should continuously retain the horizontal position till after at least two applications. At first only a small quantity, and a dilute solution of iodine in alcohol should be used, about half a drachm of a solution made of equal parts of the tincture and alcohol, and the dose and the strength should be gradually increased, on successive applications. The solution should be painted on to the arch of the vagina around the neck of the uterus, and not less than three days should elapse between the successive operations. During the period of treatment, the cold vaginal douche (77° F.) should be used several times daily, and continued for some time after the local application has ceased. The bowels should be kept free throughout the period of treatment.

XXX. 8. Spontaneous Healing of Hydrocele during Small-Pox (*Behrend*). The case is recorded of a patient who, when about to be tapped for hydrocele, took small-pox, and when he recovered from this was found to have got quit of his hydrocele, only some thickening in the neighbourhood of the epididymis remaining.

TRANSACTIONS OF The Medico-Chirurgical Society.

SESSION 1872-73.

FIRST MEETING, 6th Sept., 1872.—Dr Adams, retiring President, in the Chair.

The following gentlemen were elected office-bearers:—*President*—Dr Robert Scott Orr. *Vice-Presidents*—Dr Geo. Buchanan and Dr Andrew Fergus. *Council*—Dr James Gray; Mr Robert Grieve; Mr J. Pollock, Mearns; Dr R. Renfrew; Dr George Miller; Dr T. D. Buchanan; Dr R. Stewart, Coatbridge; Dr James Scanlan. *Secretaries*—Dr Robert Perry and Dr Alex. Robertson. *Treasurer*—Dr H. R. Howatt.

The President-elect, (Dr Scott Orr,) after a short address, read a paper on—

“THE LATENT AND CUMULATIVE TENDENCIES OF DISEASE.”

After dwelling on the difficulty often experienced in the diagnosis of disease and the great extent of the subject he had chosen for illustration, and of which he professed only to give a mere outline from the results of his own experience, he divided the subject into two heads, first, the *latent*, and second, the *cumulative*, tendencies of disease. Under the first head he remarked that *disease might be so entirely latent as not to manifest any symptoms whatever of its existence*. Organic diseases of almost every viscus of the body frequently exist and remain so perfectly latent as not to exhibit a single symptom of their presence. Especially was this the case with the two great central organs, the brain and the heart. An interesting case of double pleurisy was related, in which first one side of the chest gradually filled with serum, and as gradually subsided, and then the other, without any sign of its presence, except some degree of breathlessness on exertion, the patient ultimately making a perfect recovery.

Again, *disease may be latent, in so far that its existence could not be predicated from the few and scanty signs exhibited*. A case of obscure disease of the brain affecting the pituitary body was related in illustration, and reference made to the occasional occurrence of phthisis as a latent disease, and to Abercrombie's cases of abscess of the brain.

A third aspect under which the latent tendencies of disease may be viewed is, *that its manifestations are sometimes entirely suppressed*. Instances of these undeveloped forms of disease were alluded to under the heads of scarlatina, diphtheria, syphilis, and gout; and the following most interesting series of cases were related where there was every reason to believe that the suppressed disease was variola:—

Two old ladies, aged respectively 71 and 80, resided in a house in Edinburgh,

and were waited upon by two domestic servants. The one was a widow, the other a spinster, and they were sisters-in-law. They did not sleep together, but each occupied an apartment on a separate flat of their dwelling. The widow, aged 71, was, on Tuesday the 12th Dec. last, seized with illness. She was hot and feverish, and presented a peculiar redness of the features, great injection of the conjunctivæ, suffusion of the eyes, great prostration, and a petechial eruption. She did not send for her medical man till Friday the 15th, and in a letter received from him he remarked that "he was struck with her prostrate expression, and, on examination, found her body (the trunk) covered with petechiæ. On Saturday (the 16th), this eruption was darker in tint, more copious, and the newer spots much larger." His impression was that the case would turn out to be typhus, characterized by extensive petechial eruption. She died suddenly on Sunday morning the 17th, six days after seizure.

The other lady, aged 81, in a few days came to reside in her brother's house, Glasgow, and about ten days after the death of her sister-in-law, on the 28th December, she was seized with precisely the same symptoms, except that there was little or no prostration, and no eruption. Dr Orr was called to her next morning (the 29th), and found her with quick pulse, hot skin, furred tongue, face, neck, hands, and wrists presenting a most peculiar pink tinge, resembling somewhat the scarlatina rash, but without the minute dotting which characterises it. There was no sore throat, no petechiæ, and, as has been noted, no prostration; but the greatest possible injection of the conjunctivæ, and suffusion of the eyes. On the following day (30th) she continued in every respect the same, was no weaker, indeed, in the evening she got out of bed, and walked across the lobby, and certainly exhibited no alarming symptoms. On Sunday (31st) Dr O. received a note to say that she had suddenly sunk and died, early that morning, exactly four days after seizure, and fourteen days after her sister-in-law.

After the death of the first lady, the house in Edinburgh was dismantled, and the two servants went to reside at Portobello. One of them was complaining when she left the house, and, after a few days, a letter was received from the medical man in attendance, in which he pronounced her disease to be small-pox of a very malignant type. She was taken ill on the 25th of December, and died on the 3rd of January, eight days after seizure. With all these particulars before him, which his medical friend in Edinburgh, who favoured him with an account of the first case, had not the advantage of knowing, Dr O. could come to no other conclusion, than that the disease, to which is attached so tragical a history, was small-pox, and that it afforded a very striking instance of the malady in its suppressed form, and, but for the occurrence of the servant's case (which supplied the key to its solution), it would have remained quite unexplained. It should also be remembered that, at the time these cases happened, variola was raging in an epidemic form in Edinburgh.

A fourth aspect under which this subject might be studied has reference to *its bearings on legal medicine*. This was such a vast and important subject, that it was obvious it could not be overtaken in a short paper like the present.

The cumulative tendencies of disease were considered under two aspects—the *incubation of disease* and *recurrent disease*. The epidemic and contagious class of diseases afford the best sources of information on the obscure subject of the incubation of disease. The authority of Dr Murchison was quoted with reference to the period of incubation of typhus, relapsing, and enteric fever, Mr Marson's and Dr Gregory's as to that of variola. The curious subject of the incubation of small-pox in utero was referred to, and cases were quoted. The period of incubation in scarlatina, rubeola, and hydrophobia, were described. Finally, the cumulative tendencies of disease were distinctly exhibited in those maladies which assume the recurrent form. In these instances, the conviction was almost irresistible that during the interval the malady is gradually acquiring more and more force, till at length it culminates in a renewed outbreak of the complaint. After such an attack, it would appear, in many instances, at least, that the constitution is completely freed, for a time, from the morbid influence, and an interval of perfect health ensues, the fond hope being indulged that all fear of a relapse is at an end, alas! only to be dissipated by another rude outset of the dire malady. Examples of recurrent diseases are afforded by ague, gout, mania, melancholia, dipsomania, and epilepsy. The paper concluded with a case of epilepsy, proving fatal after thirty fits occurring in rapid succession, and where the continuity of the attacks had been broken by a mild seizure of erysipelas of the head, lasting ten or twelve days, and during which only one slight fit occurred, whereas previously they happened daily.

Dr Gairdner, after congratulating Dr Orr on his election as president, and complimenting him on the excellence of his paper, said that the subject was so comprehensive that it was extremely difficult to approach it. He would content himself with making a few observations suggested during the reading of the paper. His first remark was that a little caution must be exercised in using the term "latent" in regard to a disease which is not characterized by marked symptoms. Every practitioner of experience must have been surprised, by cases similar to those referred to by Dr Orr. But in many such cases careful observation would prove that the symptoms were not always absent, but were simply at the time unnoticed. He would state a case in point. A person occupying a very distinguished position, and owning large estates, was taken ill with apoplexy, and died within two hours. Nothing in the character of the fatal illness called for remark. He had been living his usual life, and appeared to the world to be enjoying vigorous health, and nothing was known even to his friends of any illness. On the day of his death he had been playing at golf, and during the time he was observed to stop on several occasions, and on one or two of these to give a peculiar look, exclaiming "There is my little old man again." This showed that he was the subject of some spectral illusion, and the manner in which he spoke of it showed that it was not unfamiliar to

him. He (Dr G.) also happened to know other facts which had been told to him by a friend who managed a large part of his business, from which it was hardly too much to infer that this gentleman, though apparently in the most perfect health, had for some years had a premonition, founded on his state of health, of his impending end. Dr G. had known a man shooting grouse with a heart weighing several pounds, and one with that organ eleven inches in length, was in the Highlands taking active exercise soon before he died. He lately saw a patient with aortic valvular disease, who told him facts on which he based the inference that the foundations of that disease had been laid at least twelve or thirteen years ago. This gentleman had been twice in Switzerland, and climbed passes eleven or twelve thousand feet high since he was informed by a medical man that he had some affection connected with rheumatism, which he (Dr G.) had no doubt was disease of the heart. He did not mean to say that he doubted whether there was such a thing as latency in disease. Many of the facts which Dr Orr had brought forward proved irrefutably that there was such a thing, and if any further presumptive proof were required, that disease might lie, if not latent, at least that the potentiality of it might exist unnoticed in the organism, it was afforded by the facts of hereditary transmission, and especially of the transmission of some anomalous configuration of body brought out by Mr Darwin in his work on the Variation of Plants and Animals under Domestication, and by Dr Sedgwick in the *British and Foreign Medico-Chirurgical Review*. It was shown that even such an anomaly as polydactylism could go down from father to son for some half-dozen of generations, perhaps omitting one, but again re-appearing in the next; possibly disappearing in all but a single female, through whom it is transmitted to none but males, or *vice versa*. Thus, in the same way the morbid impulse in the ovum to some kind of diseased condition, such as phthisis, would lie latent through a generation, while the potentiality of the disease would be transmitted to be developed in a subsequent generation.

Dr Scanlan mentioned a case of latent disease in a member of his own family. She had been attending school, and practising music in a room in which there was no fire. His attention was accidentally drawn to the fact that she seemed breathless one morning, and, on examining her lungs, he found one side perfectly silent. The late Dr Bell saw her at once, and, after examining her carefully, came to the same conclusion as himself—that she had an attack of sub-acute pneumonia. From top to bottom the lung appeared the same. There was no cough or spit. She recovered under Dr Bell's treatment.

Drs Ritchie and Renfrew gave several illustrations of latency from their own experience.

Dr Orr thanked the members for their courteous reception of his paper.

SECOND MEETING, 4th Oct., 1872.—Dr Scott Orr, President, in the chair.

Dr Sime, Innellan; Mr John Mackinlay, jun., L.F.P.S., Glasgow, Barrhead; Mr Robert W. Bruce, L.F.P.S., Glasgow; Mr Fred. A. Freer, L.F.P.S., Glasgow; and Mr Andw. B. Morrison, M.B., C.M., Glasgow, all of Glasgow Royal Infirmary, were admitted ordinary members.

Dr Joseph Coats read a paper on

“THE CELL THEORY, AND SOME OF ITS MORE RECENT ASPECTS.”

Dr Scott Orr, after thanking Dr Coats for his interesting paper, asked if he would explain in what way it was supposed that cells could find their way through the walls of a vessel?

Dr Gairdner said that the paper gave, in a very lucid form, an account of the present state of physiological knowledge in regard to the cell theory; but he was somewhat disappointed in the history of the theory at the omission of any reference to the name of the late Professor Goodsir. There was at one period a little controversy in regard to priority of discovery, or rather of the enunciation of some parts of the doctrine—one party going as far as to aver that Virchow had been guilty of plagiarism. This, of course, was quite erroneous. But there could be no doubt that Goodsir's view as to nutritive centres was not very dissimilar from Virchow's notion of cell-territories as explained by Dr Coats. Mr Goodsir was, at all events, entitled to the credit of being the first to depart from the views of Schwann, and to show that neither the cell-wall nor the nucleus was necessary to the idea of the cell. He remembered that Goodsir's views made a very considerable impression in the scientific circles of Edinburgh at the time, and from that time onwards it appeared certain that Schwann's views must be materially modified. He, therefore, thought that Mr Goodsir's researches entitled him to mention in any summary of the history of the cell-doctrine. Dr Coats had stated, with admirable precision, the views of John Hunter, and his position in the history of the subject, and especially had put, in a proper light, the clear insight of that great physiologist into the nature of living matter. The question of the migration of cells, to which Dr Scott Orr had alluded, was an extremely interesting one. The fact was authenticated, that a cell sometimes did attach itself to the wall of a capillary, grow through the wall, and come out at the other side. The force, however, by which it is moved was not a mechanical one. The cell grows through the wall, which closes behind it.

Dr Coats said that a considerable time ago two English observers, Addison and Waller, noticed an accumulation of white corpuscles outside the capillary vessels, and that there was previously accumulation on the inside of the vessels. Waller averred that he was able to trace the process of migration—that, in fact, he saw them going through. This statement, however, was scouted at the time. But the process had now subsequently been actually observed and described by Cohnheim. The cell attached itself to the wall of the capillary, and, as Dr Gairdner had put it, by a process of growth finds its way to the other side. With regard to his omission of Goodsir's name in his short summary of the history of the cell-doctrine, his (Dr Coats') desire had been to place before the society, in as short a space as possible, the mere fundamental facts, and the order of their development, and as Virchow may be said to have formulated the theory in its essential points, as held by modern physiologists, he had selected his contribution to their knowledge of the subject as most adapted to his purpose. He had not presumed to give anything like a history of the theory in the limits of a single paper.

THIRD MEETING, 1st November, 1872.—Dr Scott Orr, President, in the Chair.

Mr John Dunlop, M.B., C.M., St Vincent Street, was elected an ordinary member.

Dr T. McCall Anderson narrated a

CASE OF THORACIC ANEURISM TREATED BY GALVANO-PUNCTURE.

Electrolysis was had recourse to in this case as a last resource. A Stöhrer's battery was used, with only a single insulated needle, connected with the positive pole. The point of insertion was previously frozen by

means of Richardson's Spray Apparatus. A zinc plate, connected with the negative pole, was placed on the chest, about 7 inches from the point of insertion of the needle, and separated from the walls of the chest by a sponge dipped in salt water. The result of this treatment, which was repeated four times, was the reduction of the tumour to about one-fourth of its former size: it became quite solid, and much firmer than the surrounding parietes, while the pulsation and systolic murmur became much less distinct, the purring tremor entirely disappeared, and the patient was relieved of all pain and discomfort, and felt in perfect health. Dr A. thought that in carrying out the operation the object should be to induce only a partial coagulation, in the hope that this might be followed by a slow deposition of fibrin in successive layers. A sudden coagulation would tend to produce inflammation and sloughing, though it should be remembered that a moderate degree of inflammation had rather a tendency to favour the cure of aneurism.

Dr Scott Orr said, that the subject was one of great interest. These large internal aneurisms were almost invariably fatal. A spontaneous cure did occasionally take place, but this was more commonly in the case of external aneurisms, in which Dr Hodgson had related several such cases. A case of spontaneous cure in a thoracic aneurism occurred in the practice of the late Dr Joseph Bell. The tumour which was large and bulging out retired within the walls of the chest, and the patient, an old gentleman, recovered. At Dr Bell's death the patient came under his (Dr Orr's) care, and he could not then find a trace of the tumour. Any remedy which would assist in producing the deposition of layers of fibrin, and gradually obliterating the sac of the aneurism must be hailed with pleasure, and they would all rejoice if electricity, skilfully applied, proved to be such an agent. But they should not be too sanguine in their anticipations. It should not be forgotten that aneurism implied a diseased vessel, and, indeed, probably a similar morbid condition throughout the system. But the very fact of cures occurring spontaneously gave them reason to hope that the conditions under which such cures occurred could be produced artificially.

Dr Lyon feared that there might be some danger of portions of coagulated blood being thrown into the circulation, and plugging the vessels.

Dr Perry could bear testimony to the dangerous condition in which Dr Anderson's patient was before the operation. But on one point he desiderated information. Was iodide of potassium given to her when undergoing the treatment by electrolysis?

Dr Macleod said that a considerable number of cases of aneurism had occurred in his own practice, in which, if he had had confidence in galvanopuncture, he would have recommended it. He was quite familiar with the history of this mode of treatment in surgical practice. Broca had made several applications of galvanopuncture in external aneurisms, but these cases had been very unfortunate. The fundamental objection, however, to electro-puncture in treating aneurism lay in the clot which it produced. What was wanted was not a coagulation of blood, but a slow deposition of successive layers of fibrin in the sac. This was what really happened in the cases of spontaneous cure to which allusion had been made. With regard to surgical aneurisms, several remarkable cases had come under his observation in the hospital, and in private practice. One which occurred in hospital was that of a fish-hook maker, who had formerly been a sol-

dier, and while serving in that capacity had an aneurism in the middle of the left femoral artery, for which he was dismissed the service. When admitted to the hospital, he had no less than six aneurisms, two on the left femoral, one on the external iliac of the same side, a large diffused one in Hunter's Canal on the right side, and two others between it and Poupert's ligament. Amputation appeared to offer the only hope, and that the very smallest possible; but he determined to try it. He amputated the thigh in the space between two aneurisms. Contrary to his expectation, the ligature held well, and the vessel closed. The aneurisms on the same side quickly consolidated, and the man was now at his employment. He had once been consulted by a sea-captain, who complained of pain in the calf of his leg, which caused him to examine the popliteal space, where he found the mark of an old aneurism. On enquiry, he found that in a stress of hard work, the man felt something "give way" in his leg, and that this was followed by the growth of a very painful pulsatory tumour. For three weeks he had sat with the limbs flexed in one position, and at the end of that time the pain decreased, and the tumour was found to be consolidating. In fact, it was an unconscious application of Hart's method of indirect compression by flexion.

Dr Fergus said that, in regard to the matter of treatment, he had had two cases in which the results from the use of iodide of potassium were most encouraging. One case occurred more than 15 months ago, and was one of thoracic aneurism. He gave half dram doses of iodide of potassium three times a day, and afterwards 40 grain doses the same number of times daily, continuing the treatment for a considerable time. The result was a very great diminution of the aneurism. In the other case the aneurism was in the abdominal aorta, and he administered 106 grains per day of iodide of potassium for the first month, increasing the dose to 160 grains per day for the period of about two months. In this case, also, the improvement was very marked indeed. In neither of these cases were these large doses followed by iodism.

Dr St Clair Gray said that he happened to be a student at the period of the operation in these unsuccessful cases referred to by *Dr Anderson*, and he observed that when the needles were introduced there was a considerable development of air in the sac. It was well known that the introduction of air into the circulation was a dangerous thing, and might itself produce a fatal result.

Dr Anderson, in reply, said if *Dr Lyon* consulted the literature of the subject he would find that not a few successful applications of electro-puncture had been made in aneurisms in the limbs. The danger of embolism, to which some of the speakers had alluded, was one that could not be altogether disregarded, but hitherto it had fortunately proved rather theoretical than practical. He had mentioned in his paper that he had discontinued all other treatment when he began electro-puncture. He was aware that very large doses of iodide of potassium were sometimes tried in aneurisms; but there was considerable risk in the practice, and he would venture to say that had *Dr Fergus* permitted his patients to go out, iodism would probably have occurred. In regard to *Dr Gray's* suggestion about the development of hydrogen, that danger was avoided by connecting the needle only with the positive pole of the battery.

FOURTH MEETING, 6th Dec., 1872.—*Dr Scott Orr*, President, in the chair.

Mr Charles M'Bride, Esq., M.B., C.M., Royal Infirmary, was elected an ordinary member.

Dr Joseph Coats was elected Junior Secretary in place of *Dr Alex. Robertson*, who had resigned the office.

Dr Wolfe read a paper on

CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT TO THE HUMAN SUBJECT,
which will be found at page 200.

The President said that the paper was one of great interest, not only to oculists, but also to physiologists, and he had no doubt that the unusual kind of operation which *Dr Wolfe* had successfully performed in this case would stimulate discussion.

Dr Pinkerton said that he had one question to ask in regard to the last case which *Dr Wolfe* had exhibited (the case of conjunctival transplantation). *Dr Wolfe* had described in detail the operation which he performed, and the results which followed, but he omitted to state the exact condition of the eye when the case was admitted under his care. In order to make the very interesting remarks of *Dr Wolfe* on the case of more practical value in guiding them if they happened to try a similar operation, they would desiderate full information in respect to the history of the case before operation.

Dr Joseph Coats said that he also had a question to ask, viz., whether the operation in this case was an operation for symblepharon. He understood from *Dr Wolfe's* remarks that the operation was made a week after the injury. If symblepharon is a coalition of the two layers of conjunctiva, he did not see how it could be completed in the course of a week, nor indeed how an operation for symblepharon could take place within so short a period after the infliction of the injury.

Dr Anderson, Airdrie, said that a case of symblepharon had occurred in his practice in which he had tried without success to keep the two conjunctival layers separate by means of a foreign body. *Dr Wolfe* had operated in this case, and apparently with perfect success.

Dr Wolfe said that *Dr Coats* was under a misapprehension in regard to the time when the operation was performed. It took place some six or seven weeks after the infliction of the injury. He had carefully pointed out to them how far the adhesion extended before dissection, and this was the essential point in the condition of the case before operation.

TRANSACTIONS OF

The Southern Medical Society.

SESSION 1872-73.

THE 29th Session of this Society was opened on October 3rd, 1872, when the following Office-bearers were elected, viz.:—*President*, *Dr R. W. Forrest*; *Vice-President*, *Dr James Dunlop*; *Seal-Keeper*, *Dr Eben. Duncan*; *Treasurer*, *Mr E. M'Millan*; *Secretary*, *Dr John Dougall*.

The annual supper was held on Oct. 17, and at the next regular meeting, on Oct. 31st, *Dr R. W. Forrest*, the newly elected president, delivered an

OPENING ADDRESS.

After thanking the members for the honour conferred on him, he congratulated them on the prosperity of the Society, as evinced by the doubling of the number of its members within the last five or six years. The Society, he said, had fulfilled one of its functions by the holding of its usual dinner and *picnic* parties; these, as well as the regular meetings, tended to promote a friendly feeling amongst the members who, practising in the same locality, sometimes were apt to appear as if they came into collision. But, last session, the Society had recognised the importance of its other main function, by agreeing to transmit to the *Glasgow Medical Journal* regular abstracts of the work done at the meetings. The publication of such reports—which had hitherto remained locked up in their own minute books—might, he thought, be useful, not only to the readers of the *Journal*, but also to the Society itself, through the extended interest thus given to its meetings.

He next proceeded to inquire how it was that in the literature of medicine but few contributions of value were made by those exclusively engaged in general practice. The explanation was to be found in the arduous and harassing nature of the duties of such practitioners; this left but little time for the careful noting of cases, so that valuable opportunities of observation frequently slipped past unused. The whole energy of the doctor was consumed in the treatment of a multitude of cases, most of which, presenting but little that excited special interest, distracted his attention from those which, if rightly observed and reported from the beginning, might have afforded valuable material for medical science. On the other hand, he reminded the members that their position as general practitioners gave them opportunities for the study of certain stages of disease, and certain points connected with many maladies, which could be found in no hospital practice. He urged them, therefore, to make some effort to utilise the materials at their disposal, although he confessed that the impossibility or great difficulty of obtaining and making *post-mortem* examinations robbed the study of mere diagnosis of much of its value. In the midst of the difficulties referred to, he suggested to the members that by taking up one disease, or group of diseases, at a time, and by carefully noting in such cases the points which they resolved to study, they might find time to gather together some facts not otherwise easily attainable, and so make the very largeness of their practice an instrument for the accurate record of a limited range of subjects.

The president next discussed the question of open surgeries so common in this city. Although it was now usual in certain quarters to look down on those practitioners who had any avowed interest in the sale of drugs, he reminded them that many of those who had reached the highest eminence in the profession in Glasgow had at one time occupied this position. He further thought that the system of open surgeries met the wants of a

class of patients who, from their social position, would otherwise have to trust to their own or their neighbours' unskilled experience, or who would have to resort to parochial relief; and even if gratuitous dispensaries were founded for their benefit, this would tend to pauperise the population. Under all the circumstances, he thought the system at present in use ought to be defended.

Dr J. P. Cassells then exhibited a collection of aural instruments. He also explained and demonstrated their use.

THIRD MEETING, Nov. 14, 1872.—A conversation was held among the members as to *the proper diet of women after child-birth*. The general opinion expressed was that the starvation diet formerly practised was objectionable.

FOURTH MEETING, Nov. 28, 1872.—*Dr Barras* read a paper on the

“MEDICAL ASPECTS OF FRIENDLY SOCIETIES.”

He said that the medical advisers of friendly societies usually accepted such offices with the view of extending their practice. He was afraid, however, that they were as much mistaken in that respect as they were to be pitied if they accepted the appointments purely for the sake of the members' fees. These fees ranged from half a crown to five shillings *per annum* for each member, and covered medical attendance and such medicine as might be required during the year. *Dr Barras* showed that the remuneration received by the surgeon of a society for taking charge of the health of the members for twelve months amounted only to £12 10s for 100 males, most of whom were tradesmen, so that many were engaged in dangerous occupations. He thought that medical men accepting fees so much below the minimum charged in the ordinary course of practice detracted from their own independence and from the dignity of the profession. *Dr Barras* further contended that society surgeons injured themselves inasmuch as they were often called to attend members who were previously patients of their own. In like manner they caused surgeons unconnected with such societies the loss of patients whom they had formerly attended.

In the discussion which followed, *Dr Provan* stated that, as a surgeon for a friendly society, he received on an average nearly 1s 6d per visit. He contended, moreover, that, as such, he was no worse than those who kept drug shops or held parochial appointments.

FIFTH MEETING, Dec. 12, 1872.—*Dr James Morton* read a paper on

“BROMIDE OF POTASSIUM.”

(See p. 239 of present number.)

In the course of the discussion which followed, it appeared that none of the members present had observed any other than sedative effects produced by this drug.

SIXTH MEETING, 26th December, 1872—*Dr Alex. Patterson* thus narrated

“A CASE OF TETANUS LATERALIS.”

P. M., a collier, 15 years, admitted to the Royal Infirmary on November 25th. Exactly four weeks ago the wheel of a truck passed over his right leg at the union of the middle and lower third. On admission he is found to be in an extremely exhausted condition, perspiring and pulse 125; he also labours under phthisis. On examining the seat of injury a curious state of matters presents itself. About two inches of the upper fragment of the tibia is seen projecting from the wound, whilst the lower fragment is placed at nearly right angles to the perpendicular axis of the limb, and united partially by unossified tissue. There was some discharge, slight redness round the wound, and oedema of the limb. But a more terrible complication existed; he was suffering from tetanus, which set in with stiffness of the neck and jaw fourteen days ago. He can separate the teeth about a quarter of an inch, and he can speak and swallow with tolerable ease. The exacerbations occur very frequently, he asks often for drink. It is at once seen that his head is drawn down, nearly touching the left acromion, the left sterno-mastoid being greatly contracted, while the face looks away to the opposite shoulder. On examining further the spine is found to be concave to the left side, while both legs are drawn to the left: the lad, in fact, labours under *tetanus lateralis*. The whole body is curved so as to be concave to the left, the hands and arms from the elbow downwards remaining free.

Nine hours after death, which took place on the 30th, the body was not in the least relaxed, but still retained its lateral curve, the hands were not clenched. The case is so rare that Sir Thomas Watson states that he never met with a case of *tetanus lateralis*.

Dr Patterson also narrated

“A CASE OF HERNIA.”

J. B., a married woman, 40 years old, was admitted to the Royal Infirmary on Nov. 26, 1872. She complained of pain in the abdomen with vomiting. She was passed into a medical ward, but the house physician at once detected an oblique inguinal hernia in the right groin. She has been liable to this affection for the last thirteen years; it occurred after a difficult labour, when she reduced it herself. It has occurred several times since, but patient has always succeeded in putting it back until this present illness. Yesterday, when lifting a heavy pail, the bowel came down and she failed to return it. She sent for a medical man who attempted to reduce the hernia without chloroform, but unsuccessfully. This morning another medical man was called who tried for half an hour to reduce the hernia, but also without success. Upon discovering the nature of the complaint one of the house surgeons was summoned, chloroform was

administered, and after some careful manipulation, the hernia was reduced, a bandage and pad applied, and 2 grains of opium were given.

Nov. 27.—Patient had had a small motion from the bowels, but was complaining of pain at the umbilicus; abdomen swollen, hard, and extremely sensitive to pressure; vomiting had occurred at intervals, the vomited matter being dark and grumous, but without any faecal odour. Two grains of opium given in pill. The visiting physician ordered poultices and hot fomentations to be applied to the abdomen and a morphia suppository to be given.

Nov. 28.—Patient much worse: face pinched and anxious. Had vomited a great quantity of fluid which had no faecal odour. The physician directed a large enema to be given, to be followed by castor oil, but, remarking the gravity of the case, requested the advice of the hospital surgeons.

On examining the rings, the small puffy tumour indicating an empty sac was found at the external ring on the right side. I said to those around the bed, "In this case, gentlemen, the hernia has been reduced, but the strangulation remains, and the patient will die whether we operate or not." Dr Macleod, to whom the patient now belonged, came in a few minutes, and entirely concurred in the opinion I had ventured to express. As he had a pre-engagement, he kindly handed the case over to me for operation. Upon making the incision proper to this form of hernia it was found that the bowel had been fully returned. The empty sac remaining as usual in the inguinal canal, and upon slitting up the sac the internal ring was found patent, admitting the tip of the little finger into the abdominal cavity. By enlarging the incision directly upwards for half-an-inch, I was able to expose a portion of the small intestine of an ashy grey colour, with deep black patches at several places. An attenuated band of lymph was discovered tightly constricting the discoloured portion of the bowel. Upon dividing this ligature, the strangled gut became at once distended. I cut away the entire portion of gangrenous intestine, brought the healthy ends together, and secured them by means of carbolised cat-gut. The wound in the abdominal wall was secured with wire sutures, and dressed antiseptically. Ice, soda water, and opium were ordered, but the patient gradually sank, and died thirty-four hours after the operation.

Medical Intelligence, &c.

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GLASGOW SANITARY DEPARTMENT. REPORT FOR 1871.

The annual report on the health of the city for the year 1871, by Dr Gairdner, though late, will be welcomed by those who are interested in the elucidation of the intricate problems involved in the health of cities, which are nowhere more intricate than in our own city. The statistical tables on which the report is based are by far the best ever issued from the Sanitary Office, and in Dr Gairdner's hands they are made to contribute much positive information as to the sources, and some characteristics, of death in Glasgow, as well as to indicate directions for the prosecution of inquiry in future reports. As a specimen of the contents of this report, we give the following conclusions regarding mortality from pulmonary disease in Glasgow :—

“ 1. That the acute pulmonary mortality of Glasgow in 1871 varied from about 20 to about 30 per cent. of the total deaths, and from 4 to nearly 14 in 1000 of the living population.

“ 2. That the mortality from consumption (a much less definite quantity, however, because more open to popular perversion) appears to vary from about 9 per cent. to 17 per cent. of the total deaths, and from less than 3 to about 9 in the 1000 living in the different districts.

“ 3. That the mortality of both together varies from less than 35 to more than 40 per cent. of the total deaths, and from about 7 to more than 22 in 1000 living.

“ 4. That the causes ruling these enormously large district variations seem to be in the main the same as rule the general sanitary condition of the districts, inasmuch as the same order is followed to a very great extent, and in the case of the *groups* of districts absolutely, as in the general death-rate.

“ 5. That the greater or less proportion of children in the population, although of course it affects considerably the proclivity of a population to respiratory disease, does not appear, practically, to disturb the law of association just mentioned.

“ 6. That great density of population, with all its attendant evils, produces even a more marked effect upon the pulmonary death-rate than upon the deaths from all causes; inasmuch as the districts of Glasgow in which the absolutely highest death-rates are associated with the greatest, or nearly the greatest, density of population, are found to have had a death-rate from acute diseases of the lungs, and from consumption, more than *three times as great* as those in which the sanitary conditions, as expressed in the general death-rate, are most favourable.”

DISINFECTION AND WASHING OF INFECTED CLOTHING.

While in attendance upon persons suffering from infectious disease, members of the profession frequently experience much anxiety from the difficulty their patients' relatives have in carrying out efficiently instructions as to the disinfection and washing of body-clothes, bedding, &c. Indeed, in the smaller class of houses it is practically impossible for any process of disinfection of an efficient nature to be carried out. Even in ordinary middle-class houses, in the hands of persons who know nothing of the

nature of disinfection, who have no special facilities for following out, except imperfectly, even the most intelligent instructions, one can have little confidence that all is done that can be done to limit disease. Over and above all those practical difficulties, it must be remembered that to carry any infected article beyond the limits of a private dwelling, except for disinfection, with proper precautions, is a criminal offence, and as such punishable under the Public Health Act. Consequently, *to use a public washing-house*, one to which other tenants or the general public have access, for the washing of any article *which has not been previously disinfected*, is illegal. We make these observations as a preface to a statement, which it would be well for every practitioner in Glasgow to remember, that the washing and disinfecting arrangements of the Sanitary Department are at the service of the rich as well as the poor. A visit to the capacious washing establishment at Belvidere, fitted up with every appliance for disinfecting, washing, and drying, will satisfy any one how excellent those arrangements are. A note to the Sanitary Office will receive immediate attention. A cart is sent for the articles in the morning, and in the evening of the same day they will be returned. Parties who can afford it are expected to pay the mere costs of the operation, but this is always a secondary consideration with the Sanitary Department. We believe that in reference to one disease, viz., small-pox, the profession will agree in recommending all classes to avoid futile private endeavours at disinfection and washing. It has been proved by sad experience in general hospitals that by simply washing bedding infected with small-pox in a general washing you not only fail to purify the articles themselves, but infect the other articles. We understand that the authorities are determined to exercise all the powers conferred by law to prevent more especially the use of public washing-houses for the washing of articles which have not been previously disinfected to their satisfaction.

BOOKS, PAMPHLETS, ETC., RECEIVED.

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- Observations in Myology, &c., &c. By G. M. Humphrey, M.D., F.R.S., Professor of Anatomy in the University of Cambridge; pp. 192. Cambridge and London: Macmillan & Co. 1872.
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- Address in Surgery, delivered at the Annual Meeting of the British Medical Association, August 8th, 1872. By Oliver Pemberton, Professor of Surgery,

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- A Practical Treatise on Urinary and Renal Diseases, including Urinary Deposits; illustrated by numerous cases and engravings. By Wm. Roberts, M.D., Lecturer on Medicine in the Manchester School of Medicine. 2nd Edition, Revised and considerably Enlarged; pp. 624. London: Smith, Elder & Co. 1872.
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THE
GLASGOW MEDICAL JOURNAL.

May, 1873.

Original Articles.

I.—ON COLO-PUNCTURE.

By HECTOR C. CAMERON, M.D., *Surgeon to the Royal Infirmary Dispensary,
and to the Lock Hospital, Glasgow.*

(*Read before the Medico-Chirurgical Society, 7th February.*)

GENTLEMEN,—In the communication which I shall now have the honour of reading to the society, I have nothing better to offer than the recital of the details of a case which has lately come under my observation. Interesting to myself, I felt they might not prove uninteresting to many of you; and those who feel, as I read them, that there is a lack of anything like new information will, I trust, bear with me, and have their patience rewarded by the discussion to which the case is well calculated to give rise.

The subject of flatulent distension of the bowel or tympanites is one of very great importance to every medical man, whether he call himself surgeon, physician, obstetrician, or general practitioner; for while we know it may, from many causes, arise idiopathically, it is unfortunately not yet unknown as a sequel of surgical operation, or a result of the natural process of parturition. And there are few men, I fancy, who have not met in the course of practice with cases of excessive and alarming distension, such as I am about to

relate, and perhaps also experienced much the same difficulty in the treatment of it.

But before I proceed further, allow me to direct your attention for a very few minutes to a discussion which took place in the pages of the *British Medical Journal* during October and November, 1871, on the subject of colo-puncture. This discussion arose out of the publication of a paper read by Mr J. Hancocke Wathen, at the annual meeting of the South Wales and Monmouthshire Branch of the British Medical Association. In it was detailed the case of a woman, aged 29, who, while engaged in her ordinary domestic duties, had suddenly been seized with severe pain in the abdomen. Acute peritonitis followed, and the abdomen rapidly became tympanitic. In spite of all the usual remedies, the distension continued to increase. On the evening of the third day, Mr Wathen punctured in three different parts of the colon with a small hydrocele trocar. In his own words, "The immediate object, relief, was obtained, and I think that had this simple and painless operation been performed earlier, it would certainly not, to say the least, have had any prejudicial influence on the case. The patient became more exhausted and sank next morning. No *post-mortem* examination could be obtained." He mentioned other five cases in which the operation had been performed. One in which Mr Teale punctured the colon in the transverse and descending portion with the best results as regarded the intestinal mischief: the obstruction being completely overcome, and the patient, who had not passed either flatus or motion for many days, freely voided both. Unfortunately the patient was also suffering from secondary double pneumonia, to which he eventually succumbed.

Dr Fonssagrives, of Toulouse, performed the operation in two cases. In the first the patient's life was prolonged four days; in the second, six punctures were made successively, and the patient recovered. Dr Davey, of Bristol, punctured in the case of a little girl, but she ultimately died, though with great mitigation of her sufferings. Staff-Surgeon Thomas punctured the ascending and transverse

colon in tympanitis occurring in the course of a case of chronic dysentery. The man recovered so far as to have been up and about again. The publication of this paper of Mr Wathen's gave rise to considerable correspondence, in which it was shown that the operation had been very frequently performed both in this country and abroad, and always without any untoward occurrence. Death, indeed, was the result of the disease in most of the cases, but a few recoveries were also referred to, and in all the cases the suffering was without fail relieved.

It was shortly after this correspondence had closed, about the middle of December, 1871, that my case occurred, the principal points of which may be related as follows:—Mr S., about 45 years of age, had been under my care for some months previously, suffering from a surgical affection in the right foot. An operation undertaken for the cure of this resulted in an inflammation extending up the limb, exhibiting itself by the symptoms of hardness, and tenderness to the touch, for the most part in the course of the superficial veins of the leg and of the femoral vessels. This was subdued in the leg and lower part of the thigh by means of frequently renewed fomentations, and the exhibition of some mild antiphlogistic treatment. The neighbourhood of the groin, however, and upper part of the femoral region, remained swollen and painful, and the general feverish symptoms, which were very severe, continued comparatively unabated. In the course of another day or two, he began to complain of tenderness to the touch of the abdomen, and tympanitic swelling commenced. This was preceded by one or two sharp rigors, and accompanied with frequent, copious, and watery stools. The pain in the abdomen was soon severe and constant. This state of matters was somewhat insidious in onset, and obscure in origin, but was, we thought, probably an extension of the inflammation which existed in the right leg and thigh. At this juncture, Dr M'Call Anderson saw him daily with me in consultation. The patient's condition soon became very precarious. The tongue was hard and dry; the pulse varied

from 120 to 140; thirst was excessive; sickness occasional; while frequent rigors occurred, followed by most exhausting perspirations. The abdominal distension was extreme, causing pain, inability to take nourishment, and a distressing sense of weakness and breathlessness. It was always to a certain extent relieved by a motion from the bowels, but the gas soon re-accumulated. None of it could be voided, except when the patient was on the bed-pan; and, because of the comfort he obtained for a short time after an evacuation, he was led to encourage their occurrence. As in this way they were frequent and always copious, it soon became very obvious that this continued diarrhoea was fast undermining his strength. Finding, therefore, that the bowels could be almost completely controlled by the injection of a drachm of laudanum in starch, given night and morning, Dr M'Call Anderson proposed that we should by this means stop the diarrhoea, and treat the increased accumulation of gas by the operation of colo-puncture. (All the usual remedies for the dispersion of flatulence were administered, some by the mouth, some by the rectum, others, such as turpentine, in both ways, but with no avail.)

Accordingly, on the 20th December, without rules for our guidance or warning, I made an attempt, Dr M'Call Anderson being present, to puncture. The only cannula which I could obtain, of at all suitable character, was small in diameter, but unfortunately fitted ill round the neck of the trocar, the latter having no shoulder on it at all.

Having driven them into the abdomen over the situation of the transverse colon, and withdrawn the trocar, we found that no gas escaped. I again introduced the trocar and, withdrawing the instrument a little, once more pushed it forward, but with no better success. It now became evident that the edge of the cannula refused to enter the soft and yielding inflated gut, and we abandoned any further proceedings until the next day, when I obtained a more suitable instrument. This was a cannula and trocar of good shape and small in diameter, but no longer than such as is commonly used in tapping a hydrocele. With this instrument I

again punctured (21st December), the distension being very great. The site chosen was very much the same as that of the day before, and, on withdrawing the trocar, the gas whistled freely out of the cannula. After a very considerable quantity had escaped, but long before the abdomen had regained its natural shape, the escape suddenly stopped; and all attempts to obtain the re-establishment of it were fruitless. The gut in collapsing had evidently freed itself from the very short part of the cannula it contained in its cavity. The patient, however, expressed himself as greatly relieved. On the following day (22nd December), the distension was as great as ever; and an instrument of a satisfactory character, which had been ordered, having been obtained (the cannula being $3\frac{1}{2}$ inches in length, and $\frac{1}{8}$ th of an inch in diameter), I again punctured with it in nearly the same position. The gas escaped freely, and the abdomen fell fast. Anxious to expel all the gas, we kept up rather firm pressure on the abdomen; but to our disgust, before all the gas had been thus got rid of, we pressed a quantity of liquid fæces through the cannula. I wiped away carefully what had passed, and, giving time for any that remained in the cannula to gravitate back, I plucked it out with my thumb firmly over the orifice, so as to retain, if possible, any fluid that might still be in the cannula, in the same way as one lifts fluid in a pipette.

The patient was greatly relieved in breathing, and the pulse fell considerably even before we left the room. No evil consequence ensued, and he expressed himself that evening as being very comfortable.

On the following day (December 23) the operation was repeated with equal benefit, but no pressure was used, so much of the gas only being got rid of as escaped spontaneously.

Again, on the next day (December 24), I punctured in the situation of the descending colon, the patient lying on his back, and the instrument being introduced parallel to the surface of the bed. On withdrawing the trocar, a small quantity of liquid fæces was forcibly shot out on to the car-

pet of the room by the first burst of gas: but no more followed, and a great quantity of wind was got rid of.

On the following day (December 25) I punctured in nearly the same position, but drove in the instrument at right angles to the surface of the bed, the patient still lying on his back. No fæces escaped, the evacuation of gas was most satisfactory, and the relief to the patient, as on all the other occasions, was very great.

On December 26 it was not thought necessary to puncture, the flatus being relieved during the passing of a liquid stool, and not re-accumulating very rapidly.

On the morning of December 27, however, the distension was again very great. About 11 A.M. I punctured in the situation of the transverse colon with good results. Shortly before mid-night of the same day my patient sent, begging I would repeat the operation. The distension was again extreme, and his sufferings from the embarrassment of the breathing very great.

I did repeat the operation, giving vent to an enormous quantity of wind, and leaving him much relieved, and inclined to sleep. On the following day we found that he had passed a good night, and, although considerable distension existed, the gas had not, we thought, re-accumulated to such an extent as to render operation necessary. Indeed, we never again required to puncture.

The distension, although it continued more or less for a week or ten days, never again attained an extreme limit; and, in a day or two after our last operation, he began to void small quantities of wind in a natural manner.

In a month afterwards, as regarded the affection of the abdomen, he was quite well, and has continued so since, although now in a most precarious state of health from serious ailments of chest and limb. Puncturation was performed, it will thus be seen, eight times in all, and on every occasion, except the first (when the bowel was not entered), to the marked relief of the patient. The operation itself, if effected with a trocar in good order, and by a quickly-delivered firm stab, is almost painless, and

may be rendered absolutely so, as was done in the case under review on the last four or five occasions of puncturing by the application of a little ice and salt to the spot selected, or by the use of Richardson's spray apparatus. As to the selection of the point for puncture, I may say that I chose on each occasion a point over the position of some part of the colon, where the percussion was most distinctly tympanitic.

Only one of the little punctures gave any uneasiness whatever. Two days after it had been made, the patient complained of its being tender to the touch, and a little redness began to show itself in an area round it of the size of a sixpence. This culminated in a minute abscess in the skin, which burst, yielded a little pus, and closed without giving further trouble.

The class of cases to which this operation is applicable naturally falls into two important divisions: first, those in which, like my own, there exists no mechanical obstruction to the escape of the contents of the gut; but where the extreme accumulation of flatus is caused and maintained by the fact that the rapidity of its generation is out of all proportion to the power of getting rid of it; and, secondly, those in which some such mechanical impediment does exist. It is in this latter description of case that the operation has, of course, been most frequently performed, because the former is of much rarer occurrence, and can generally, I am aware, be managed by other and better-known methods of treatment. Thus, a long tube passed up the gut as high as can be conveniently accomplished, when other means have failed, often accomplishes the object in view. Puncture, however, appears to me to possess certain advantages over the tube, and not, if the necessary precautions be adopted, to be accompanied by greater risks; for it appears there is some danger in the use of the tube, and at all events it will be allowed that there is considerable discomfort to the patient. The difficulty of its introduction is not always slight, and its success by no means uniform. In the cases where mechanical obstruction is the cause of

distension, it must, I imagine, very generally fail, although it must be confessed that in such cases it may prove a very important aid in the diagnosis, and for this reason, if for no other, ought to be used. The great objection to the employment of the tube, however, as compared with that of the trocar, appears to me to be the undesirability of repeating the operation on more than one occasion. In the case we are now discussing I feel sure that it would not have been tolerated, even had other circumstances not rendered its use highly undesirable.

The gut has been punctured, I believe, in the case of strangulated hernia, as well as in such cases as I have referred to; punctured, of course, in that part of it included in the strangulated tumour. This has been done, but I fear with indifferent success, with the object of getting rid of the flatus contained in the strangulated bowel, and thus, by reducing its bulk, allowing of its easy return into the cavity of the abdomen. The example is one that the most of us, I fancy, would be very chary in following. Besides being open to all the objections brought against operations that provide for the return of strangulated hernia without opening the sac (that is, without being aware what the condition of the gut is, that we are returning), it appears to me to be open to this additional objection that, if it do not succeed and operation become necessary, the free handling of recently-punctured gut might possibly lead to unpleasant consequences.

It may be thought by some that it must be a rash proceeding in a case such as mine, where the peritoneum is in a state of more or less acute inflammation, to irritate it still further by driving through it and again withdrawing so substantial an instrument as the necessary cannula and trocar. As a matter of fact, however, the operation appears in no way to increase the inflammatory action; and this will cause the less surprise when we remember, that Mr Wathen has pointed out, that in one well-known case the operation of ovariectomy was undertaken, and followed with the best results, during an acute attack of peritonitis.

It is a matter for curious speculation why no escape of fluid should take place from these punctures into the cavity of the peritoneum. The gentleman I have just referred to, in a letter in the *British Medical Journal* for November 25, 1871, wrote in regard to this:—"The size and character of the puncture when made with a fine trocar and cannula are such, I think, as to bring the chances of extravasation very low. The puncture merely separates the muscular fibres, and on the withdrawal of the cannula, the muscular planes immediately re-adjust themselves, or a protrusion of mucous membrane takes place, which entirely prevents the escape of the intestinal contents, as was demonstrated by Travers in cases of punctured wounds of intestine, when the incision did not extend beyond three lines in length. The influence of pressure of the abdominal walls and contents in cases of non-protruding intestine, is clearly shown by Mr Erichsen, when he states that fæces escape from a smaller aperture in a protruding than in a non-protruding intestine. He also refers to two cases of wound of intestine without any extravasation. A similar case occurred in my father's practice, when a man, killing a pig, stabbed himself accidentally in the abdomen; the intestine did not protrude, but the patient passed a large quantity of blood per rectum. He recovered without a single symptom of extravasation. Clinical experience, therefore, shows that non-protruding punctured wounds of the intestine of less than three lines in diameter may be said not to allow of fæcal extravasation. The lesion in colo-puncture comes so much within these limits that I venture to think it may not deter us from resorting to this method of, at the least, relief."

In addition to the opinions here given by Mr Wathen, I think we may be re-assured in regard to any risk of fæcal escape, by reflecting upon what the condition of the gut itself must be after the puncture has been made. Having just been enormously distended, and now being thoroughly collapsed, the mucous membrane must be thrown into very redundant folds, and this of itself will act in the way of

occluding the very small wound made through the wall of the gut by the operation.

An idea is very prevalent that the operation of puncturing the intestine is frequently performed in the case of cattle, but this has been pointed out to be a mistake. So general, however, was the belief, that even so well informed a writer as Sir Thomas Watson, has repeated it in the last edition of his lectures on the Practice of Physic. He writes:—"There is one further expedient which I should recommend in those trying cases which we know (no matter how) are of necessity fatal. In cattle that are *blown* by over-feeding on wet clover, a rough procedure, that of piercing the distended bowel with a hay-fork, has often been practised by farmers with complete success. The distress from extreme distension of the intestines by wind is so intense, the craving for relief from that distress so importunate, and the comfort on obtaining it so great, that were I the subject of such pressing and prolonged torment, I should beg to have the inflated bowel eased by puncture with a fine trocar, even if I might (what is improbable) lose a day or two of painful life." Now, the truth is, that the affection of cattle here referred to (which is known as "*Hove*" or "*Blown*") is an acute indigestion, and the distension occurs not in the intestines at all, but in the rumen or paunch. If a herd of cattle have been, by driving, subjected to a long fast and then turned into pasture, they are very apt to give full swing to their appetites and eat hurriedly and greedily, take no time to stop for rumination, and soon the rumen becomes so distended that it is unable, as sometimes happens in the human subject in the case of the over-distended bladder, to expel its contents. Fermentation takes place, gas is evolved, and the distension rapidly increases until the animal is destroyed by the pressure on the diaphragm causing suffocation.

Tympanitis, or wind colic, as it is called, being really a collection of flatus in the bowels, does also occur, and it has been operated on successfully with a cannula and trocar, but the operation appears to be attended with great danger, and is hardly thought justifiable except when the recovery

of the animal is absolutely hopeless. So little apt, however, is the rumen or first stomach to suffer from inflammation or to resent operative interference, that it is customary to incise it to the extent of several inches, and to remove not only the gas, but the clover and grass which constitute the head and front of the offending. The difference, then, between colopuncture and such an operation as puncturing the rumen in the ox will be seen at once, and the one in no respect affords a parallel to the other.

Allow me now, gentlemen, to sum up these remarks by indicating what I think are the precautions necessary to be taken in the performance of the operation, precautions which are indicated by the several mishaps which, as I have told you, occurred during the treatment of my case.

I. Care must be taken to secure a cannula which fits very accurately indeed round the collar of the trocar, so accurately that if the finger nail be run from the point downwards it should hardly be caught at all by the edge of the cannula. Unfortunately, instruments are not always so made, although any ill-fitting at this point between the two component parts of the instrument is always, and in every class of case for which it is used, not only very undesirable, but even occasionally a source of embarrassment and annoyance to the operator. I have myself felt difficulty in driving such a badly-constructed instrument into the tunica vaginalis, although the parts were put upon the stretch, and the hydrocele rendered as tense as possible by being grasped in my left hand in the usual way. And if this be the case with hydrocele, it will be readily understood how much more likely it must be to occur in the case of a soft and yielding bag of air, lying unsupported, so to speak, in a cavity like the abdomen. The mishap, it is true, is one devoid of any great peril, but at all events it disappoints the operator, and pains and alarms unnecessarily the patient, who, finding no air issue from the tube, comes to think that the hopes of relief which have been raised in his mind are illusory and vain.

II. Care should be taken that the instrument is of suffi-

cient length. The ordinary hydrocele trocar, if we consider how great a part of it is occupied in passing through the thickness of the abdominal walls, is much too short. Only a small piece of the cannula remains in the gut, and, as occurred in the present case, the gut in collapsing frees itself. The cannula, then, should be three or four inches long. A certain length of this may be marked off by the finger and thumb grasping just above it, and this may be driven without fear into the abdomen. The trocar may then be withdrawn, leaving a great part of the cannula projecting above the skin; and as the belly falls, this may, so to speak, be "paid in" to such extent as may prove necessary.

III. Any great amount of pressure upon the abdominal walls must be avoided. When the gas is nearly exhausted one is tempted to use a little pressure; but it is just then that the danger of squeezing out fluid becomes greatest. If it is suspected that a quantity of fluid fæces is contained in the intestines as well as the gas, I should think it more prudent and safe to avoid pressure altogether, and to be content with such an escape as may occur spontaneously, and in all cases to make use of pressure with the greatest moderation. Although we have seen that fæces may escape through the cannula and do no harm, it must be apparent to every one that such an accident introduces a grave element of danger. If I had to perform the operation in another case, I should take care to supply myself with a small syringe, capable of fitting into the end of the cannula; and by this means would be enabled to wash back into the bowel with a little tepid water any fluid which remained in the instrument before withdrawing it. The outside of that part of the tube which is in the gut seems to be wiped clean by its passage out of it.

IV. Care ought to be taken always to puncture at that part of the intestine which is highest as the patient lies in bed. The neglect of this precaution may lead to a jet of liquid fæces being shot out with the first sudden explosion of gas, as occurred on the occasion when I tapped

the descending colon; the direction of the trocar being parallel to the surface of the bed, and the patient lying on his back. The occurrence, I fancy, is somewhat analogous to the loss of fluid by the opening of a bottle of soda water or champagne held in a faulty position.

If such precautions be employed it seems to me not too much to hope that, by means of this operation, we may occasionally save a life; or, at all events, we may do that which ought to be an object of equal importance,—when it is no longer possible to save life, we may lighten in some degree the shadow of death.

II.—ON PULMONARY DISEASE IN GLASGOW—ITS PREVALENCE AND DISTRIBUTION.

By ALEXANDER SCOTT. *Being part of a paper on "The Vital Statistics of Glasgow," read before the Sanitary Section of the Philosophical Society of Glasgow, February 17, 1873.*

In a former paper* based on the returns for the two years, 1869 and 1870, it was shown that the high death-rate of Glasgow, as compared with other Scotch towns, was not due to epidemics, but principally to lung diseases, especially in their acute forms. Of every 1000 deaths in Glasgow, bronchitis, pneumonia and pleurisy caused 205, while the corresponding number in other seven towns was only 141. Phthisis carried off 128 in Glasgow, against 113 elsewhere, in every 1000 deaths. But taking the acute forms alone, the mere EXCESS in these was nearly equal to the whole MORTALITY from fevers.

The question immediately presented itself—Is the excessive liability to lung diseases characteristic of all the districts of the city, or is it confined to certain districts in particular? And if confined to certain districts, are these the ones with the highest aggregate death-rates, and is this the principal cause of their unenviable pre-eminence? Notwithstanding the momentous importance of this question,

* See Extract, pp. 194-8 of this Journal for February, 1872.

there was then no possibility of answering it. Neither the local returns, nor those of the Registrar-General, detailed the number of deaths from lung diseases in individual districts.

Last year, however, great extensions and improvements were introduced into the returns made up in our local Sanitary Office. Among other things of great importance, these embraced the subdivision of the city into twenty-four districts, and the addition of several columns to the analysis of causes of death. One of these is devoted to consumption, and another to acute diseases of the lungs. By combining the information thus supplied with that furnished by the Registrar-General, we have now, for the first time, the means of finding a rational answer to the question so long left to surmise.

As has been stated, the local sanitary authorities only adopted the scheme referred to last year, but (retrospectively) a report has been made up on that basis for the previous year (1871), and before long we will doubtless get the figures for 1872, thus affording two years' numbers, from which to calculate averages for a more exact summary than it would be worth while to base on those of a single year. The year 1871, however, had this peculiarity—it was characterised by a high death-rate in Glasgow, and a low mean death-rate in the other seven large towns of Scotland. It was therefore an exceptional year, and before its individuality is merged in the average of a longer period, it may not be unprofitable to give it some consideration by itself.

Let us first see what were the causes of our excessive mortality in 1871. For the present purpose it will be sufficient to classify the deaths under four heads:—(1.) Fevers; (2.) Other important Zymotics; (3.) Lung Diseases; (4.) Other or General Causes. Compiling from the Registrar-General, we find the mean death-rate, per 1000 of the population, in the seven towns—Edinburgh, Dundee, Aberdeen, Paisley, Greenock, Leith, and Perth—to be as detailed in the following table. Opposite these figures, we place the

numbers for Glasgow, and show the difference—unfortunately an excess in Glasgow on each head:—

| | Mean of Seven Towns. | Glasgow. | Excess in Glasgow. |
|-------------------------------|----------------------------|----------|--------------------------|
| Fevers, | 1.22 | 1.51 | 0.29 |
| Other important Zymotics, ... | 4.60 | 5.63 | 1.03 |
| Lung Diseases, | 6.98 | 11.65 | 4.67 |
| General Causes, | 12.95 | 14.10 | 1.15 |
| Aggregate Death-rate, | 25.75 | 32.89 | 7.14 |

Turning the excess into percentages, we find that in Glasgow—

| | |
|--------------------------------|---|
| Fevers | are 24 per cent. higher than elsewhere. |
| Other Zymotics | “ 22 “ “ |
| General Causes | “ 9 “ “ |
| Lung Diseases | “ 67 “ “ |
| The Aggregate Death-rate being | 28 “ “ |

And of the extra deaths in Glasgow—that is, of the 7.14 per 1000 of the population, by which the Glasgow rate exceeded the average of other towns (and which amounted in the year to a loss of about 3500 lives in the city):—

| | |
|----------------------------|-------------|
| Fevers, Contributed | 4 per cent. |
| Other Zymotics, “ | 15 “ |
| General Causes, “ | 16 “ |
| Lung Diseases, “ | 65 “ |

If the incidence of lung diseases in Glasgow had been taken from the local Report, instead of the Registrar-General's, these scourges would have been debited with a death-rate of 12.66 instead of 11.65, the number put against them in the foregoing table; and they would consequently have shown a fatality here upwards of 80 per cent. in excess of other places, and would have constituted a correspondingly high percentage of our extra deaths.

Here, then, was our weak point. Out of every 100 deaths we had, in excess of the mean rate of other towns,

not less than 65—perhaps nearer 80—were due to lung diseases alone.

Consumption and the acute diseases of the lungs are here taken together, in deference to the opinion that, in cases not medically certified, they might be confounded by relatives in the registration, these persons being sometimes uncertain of anything further than that it was a chest complaint. When it is considered, however, that consumption is to a large extent hereditary, and that it is only in the rarer cases in which it is acquired that local circumstances can be greatly blamed for it, little hesitation can be felt in concluding that the tables are substantially correct, when they indicate that the great bulk of the extra mortality under the general head properly falls to be set against the acute forms—in other words, bronchitis and pneumonia (pleurisy being so unimportant that it may be left out).

To show the influence this excess has on the death-rate, it may be sufficient to point out that—apart from lung diseases—all other causes of death (epidemics included) were only about 13 per cent. more fatal in Glasgow than in the other towns. Supposing this were assumed as the natural penalty of life in a city like ours, and that lung diseases, instead of showing 67 per cent. of an excess (the lowest estimate) had only been aggravated to the *same extent as other diseases*, there would have been a diminution of $3\frac{3}{4}$ per 1000 of population in the death-rate; that is, our death-rate of 33 would have been kept down to $29\frac{1}{4}$ —representing a saving of 1800 lives in the year under review.

We come now to the inquiry, Where does this excessive liability to lung diseases show itself? Is it confined to certain quarters of the city, or is it general?

To answer this question we will take advantage again both of the Registrar-General's returns and those of the local Sanitary Office. The first line (mean of seven towns) in the following table is compiled from the former; the other lines (Glasgow) are calculated from the latter. By the

“worst six districts” is meant the six having the highest aggregate death-rates; the “best six” are those with the lowest aggregate rates.

| | | Death-rate from all Causes. | | Death-rate from Lung Diseases. | | Proportion Lung Diseases bear to whole Deaths. |
|---------------------------------|-----|--------------------------------------|-----|---|-----|---|
| Mean of Seven Towns, | ... | 25 $\frac{3}{4}$ | ... | 7 | ... | 27 per cent. |
| Best Six Districts in Glasgow, | | 24 | ... | 9 | ... | 37·4 “ |
| Whole of Glasgow, | ... | 33 | ... | 13 | ... | 38·4 “ |
| Worst Six Districts in Glasgow, | | 45 | ... | 18 | ... | 39·6 “ |

It will thus be seen that the distribution is surprisingly general. While the actual deaths from lung diseases vary from 9 per 1000 of population in the best six districts, to nearly 18 per 1000 in the worst six, these rates bear very nearly the same relative proportions to the whole deaths, in both cases. There does appear a tendency to increase in passing from the better to the worse subdivisions, but it is quite trifling. Over all Glasgow the deaths from these causes constitute 38·4 per cent. of the whole deaths; in the best parts they amount to 37·4, and in the worst to 39·6 per cent., while in the other seven towns they cause only 27 per cent. of the whole deaths. The jolt then (so to speak) is between Glasgow and other towns, and in Glasgow itself there is comparatively little difference in this respect. In no town except Glasgow does this percentage rise so high as 30; in no subdivision in Glasgow does it fall so low.*

This is a result little expected. That there may be no misunderstanding it may be as well to repeat. Whatever it may be called—whether a weakened vitality, diminished resisting force, unwholesome conditions, or whatever else—that permits the ravages of all sorts of diseases to become twice as severe in the bad parts as in the good parts of the

* It may, of course, be said that, as lung diseases were unusually severe in the year under review, the results of further observation may perhaps modify to some extent the conclusions suggested by the figures with which we have been dealing. But if there were great inequalities in the distribution of these complaints, one would naturally expect that an exceptionally severe year would be precisely the one that would bring these inequalities into the boldest relief.

city, we find that lung diseases are just about doubled along with the rest, and thus retain the same proportion to the whole deaths, causing about three-eighths of the mortality, all the city over; whereas, in other towns, they cause very little more than one-fourth. It may be observed that on grouping together the subdivisions bordering on the Clyde, no general tendency to special excess in this respect is noticed; and, further, that in St Rollox sub-district, taken by itself, the mortality from these causes, so far as 1871 is concerned, was both relatively and absolutely below the average of the city.

The difficulty of accounting for the frightful excess of our mortality from pulmonary disease is thus thrown further back. We must find it in something wherein Glasgow, as a whole, differs from other towns, rather than in anything in which one part of Glasgow differs from another. The consideration is a painful one. But if it be a fact, no good can result from ignoring it. The sooner we face it the better; and if medical men and sanitarians, to whom the mere statistician naturally looks, should be induced a little sooner to turn their attention earnestly to the question, I shall rejoice that I was led to bring forward the subject on the present occasion.

III.—CASES FROM INDIAN PRACTICE. ASCITES—USE OF DRAINAGE-TUBE.

By JAS. DONALDSON, M.D., *late of Her Majesty's Madras Medical Staff.*

UNDER the above heading I would venture to bring under the notice of the readers of the *Glasgow Medical Journal* certain cases which, during my term of service under Her Majesty's Government in India, amongst multitudes of the ordinary routine of medical and surgical diseases, whether in hospital practice or in private life, have struck me as being of interest and worthy of record, some from peculiar features in the cases themselves, others from the unusual progress or unexpected termination of the morbid action, others again from the treatment found effectual, or the practical lesson to

be derived therefrom. I suppose that in any hospital, a physician or surgeon will at times make bold, when the prescribed or recognized rules of the profession seem to fail in their object, to use remedies, or essay methods of treatment which he would scarcely dare to venture upon in his private practice; but be this so or not in our home hospitals, I venture to assert that it is so in many of those abroad, especially in India, where the circumstances attending a case are often quite unique, following no known rules, and therefore beyond, as it were, the pale of criticism, and where we have to do with a habit of body in the native Hindoo quite different from that of the inflammatory European, easily succumbing to sudden accessions of violent diseased action, but being all enduring as to chronic forms of illness, and tolerating an amount of handling of vital organs, and interference with functional processes, which would scarcely be believed by any one unacquainted with the peculiarly phlegmatic temperament of the natives of India, and which the most bold would hesitate to apply to the fuller-blooded people of more northern latitudes; and I offer these preliminary remarks with the view of explaining what might otherwise appear, to men accustomed only to home practice, meddlesome, rash, or unsanctioned treatment—premising also that both medical and surgical practice in many of our tropical dependencies, at all events and more especially in the East Indies, must oftentimes and in many diseases be bold and energetic in the quickly-advancing diseases of such a climate, if success is to be looked for at all; and that treatment to be safe, paradoxical though this statement may appear, must often be removed from the ordinarily recognized path of safety. Beginning with my private register of hospital patients, I take the first in the list of the histories recorded therein.

Disease, Ascites.—Ponamah, female, aet 35. Caste or country—Hindoo, native of Madras. Admitted into the Government hospital at Vepery, Second District of the Presidency town of Madras, on 30th April, 1864, in a distressing state of helplessness, breathlessness, and weakness, enormously swollen, abdomen distended apparently to fullest limit, skin

tense. As it is not intended, and would serve no useful purpose in these succinct histories, to give *minute* details of symptoms and treatment here, it may be merely noted that the object primarily looked to in this instance was, bringing the patient into the best state of preparation for the operation of paracentesis abdominis, with the intention of performing it at the earliest date. Mild aperient medicine, warm baths, and saline diuretics were the remedies indicated. There was no history detailed to account for this abnormal collection, no apparent disease of liver, heart, kidneys, or other organ; the urine not noted as being much different from the ordinary standard unless small in quantity, which was to be expected, and which would naturally be more prominent from the high temperature prevailing at that time, viz., 95° to 100° Fahr. in the large, well-appointed hospital, daily. On May 6, there appearing to be no reason why the operation should be delayed, and the patient being exceedingly anxious for its performance, "tapping" was carried out in the usual way, the patient lying well over on her side, and twenty-two (22) pints of fluid drawn off. (Patient would weigh, in health, about 90 or 95 lbs., but this could not be very exactly ascertained). The relief afforded by the removal from the abdominal cavity of above 400 ounces of fluid was very grateful, and a bandage being applied with comfortable pressure, the patient expressed herself as feeling "restored to health." On careful examination, now that the different organs were more within reach of proper observation, no chronic disease of liver, heart, or kidneys was discovered. The heart's action was feeble, nothing more. The patient, with good nourishment, and very moderate and temporary use of stimulants, soon felt strong; but the process of re-filling commenced but too soon, and with sufficient quickness. As diuretics, the acetate, nitrate and bicarbonate of potass were given, with iodide of potassium; also carbonate of ammonia and squill; the old "compound iodine ointment" was rubbed assiduously into the abdomen, and careful bandaging kept up; but in the end of May the distress and dyspnœa were again

such as to cause the poor woman to beg for relief. On 2nd of June tapping was again had recourse to, nearly eleven pints of fluid on this occasion being removed. Now, as this probable often-repeated paracentesis seemed to promise only very temporary relief, with the almost certain prospect of rapid prostration of patient's strength, the idea was entertained of not only withdrawing as much fluid as possible, but farther, of allowing it to drain away as it formed, with the hope that by aid of steady, carefully-applied pressure kept up, even if a moderate amount of inflammation should be excited in the cavity, a radical cure might be expected. This view of the case, and this proposition being placed before the patient, she readily assented, preferring any risk (as natives of India usually do) to the prospect of repeated accumulations and operations. Accordingly, after as much of the fluid as possible had been drained off, the bandage being carefully adjusted, the cannula was left in, and tied in such a way as to act like a drainage tube—a small cork having been first fitted to it, so that, instead of the drain being constant, the cork could be taken out at short intervals, and any little collection of fluid allowed to run away. On 3rd June, this is the report—"Little or no fluid has passed by the cannula since the operation; there is a little pain just where the cannula is inserted; no general pain, no threatening of peritonitis, no fever, no bad symptom, but the patient, as on the former occasion after operation, is weak, and the pulse is feeble. Bowels and kidneys acting well." On the 6th, little fluid appeared to have been secreted, and the report is—"Abdomen getting smaller instead of immediately commencing to increase in bulk as it did last time, and the flannel binder was tightened yesterday; no pain or uneasiness of any kind; patient feels well and is sitting up." On 16th, the cannula had got dislodged. It was not thought advisable to try to replace it, and report is—"Water threatening to collect again, but not much; the compound iodine ointment to be rubbed in, and the diuretic medicines given as before." 21st June—"Feels easy and well, little change of any kind; to

continue idem." On 15th July, patient was well in all respects (except that the fluid in abdomen had increased somewhat) and afraid that it would augment farther, and bring on the old, uncomfortable symptoms, she wished the cannula replaced, and the drain re-established, but this was not considered advisable or necessary. After this date there was occurrence of fresh symptoms, viz., congestion in several organs (liver, lungs, and kidneys), with pain in the right hypochondrium, some oppression of breathing, and albuminous urine; there was no retarded circulation from re-accumulation of water to account for this, and probably the patient had got a chill from exposure to the strong hot land wind, or the stronger chilling sea breeze which daily succeeds it, after the free perspiration caused by the excessive heat. Besides warm baths, and re-induction of the skin's action, all that was thought necessary was the application of a large blister over the abdomen, just below, and over the lower portion of the liver. These means were effectual. On 21st July "patient was easier, breathing comfortable, lungs relieved, pain gone, urine copious, and free or nearly so of albumen;" the medicines ordered to be continued, the blister dressed with mild ointment. On 29th, "collection of fluid apparently stationary, not increasing." From this date the patient's condition, from being "stationary," began to improve; the fluid in abdomen, instead of increasing, decreased; and the report is—"From this date the poor woman slowly but steadily improved in health, the various organs re-assumed their natural state, and satisfactorily performed their functions. The remaining fluid in the abdomen was absorbed, the belly regained its proper shape, and she was discharged from hospital, after being kept sufficiently long under observation, apparently 'quite well' in the beginning of January following."

There were, I think, several points of interest in this patient's illness—*e.g.*, the large accumulation of fluid in this small woman without apparent organic disease; without apparent note-worthy obstruction to the return of blood, by the portal vessels, to the heart; without any previous history

of active inflammation of the peritoneum, or obvious chronic inflammation of the same, &c. Sir Thomas Watson records a case almost identically the same in its more obvious aspects, referring to it as "a condition he believes he had met with." Again, the rapid re-filling of the sac without any manifest exciting cause after the first operation of withdrawal, under nearly the same existing conditions; the circulation being so much more free by the abstraction of the heavy mass of fluid before weighing on the abdominal organs, and oppressing, almost paralyzing, the action of the diaphragm. But the main point was the establishing a drain from the peritoneal sac with the strong risk of almost inviting, as it were, inflammation within the cavity. I cannot call to remembrance seeing such procedure anywhere recommended, and I would not have proposed such in an European, nor ventured upon it in private practice, but "the end justified the means," I hope. I had only one other very similar case in India, the details of which need not be given, except just stating the leading facts. The patient was also a female, native of the Madras Presidency, admitted into the Garrison Hospital at Vizianagram in 1860; had been "tapped" (by my predecessor in office), the sac had gradually refilled; there was no discovered organic disease, and no "history." I operated once, and drew off a large quantity of fluid, then (on the second occasion) left the cannula tied in, and established a drain. There was no bad result; on the contrary, the process of re-filling was checked, the drain was free, and I was indulging hopes of a complete cure when the woman, tired of hospital, or thinking she was well enough, went away without "gratia," seu "vale," as is very common with the natives of India when the spirit moves them, and I saw her no more; could not even hear what had become of her during my short remaining term of duty in the station.

IV.—ON THE DISSEMINATION OF ZYMOTIC DISEASES BY MILK.

By JOHN DOUGALL, M.D., *Medical Officer of Health for the Burgh of Kinning Park, Glasgow.*

(Read before the Sanitary Section of the Philosophical Society, 7th April, 1873.)

THAT enteric fever has been disseminated over wide areas by milk supply is now an established fact, in support of which we have Dr M. W. Taylor's paper* on an outbreak of enteric fever at Penrith; Dr Ballard's† and Dr Robinson's‡ reports on similar outbreaks, one at Islington, and two at Leeds; also Dr Russell's§ recent report on an outbreak at Parkhead. That scarlatina has been disseminated by milk was satisfactorily shown by Professor O. Bell|| of St Andrews, and quite recently by Dr Robinson of Leeds. Such being the case, I have attempted to examine the matter scientifically, and if I have partially succeeded in placing it in a clearer light I shall be satisfied. It may be here remarked that it seems to me highly probable that, if milk can propagate typhoid and scarlatinal contagia, it can also propagate the contagia of the other zymotica. Proceeding on these premises, I shall consider—1st, The probability of zymotic poison being generated in milk *de novo*; 2nd, The probable nature of zymotic poisons; 3rd, Is milk a congenial soil for the propagation of zymotic poison? 4th, How may milk get infected with zymotic poison?

THE PROBABILITY OF ZYMOTIC POISON BEING GENERATED IN MILK.

In regard to this, I may first state that many distinguished physicians believe in the spontaneous origin of

* On the Communication of the Infection of Fever by Ingesta. By Michael Waistell Taylor, M.D., Edinburgh. *Edinburgh Medical Journal*, 1858.

† On an Outbreak of Typhoid Fever at Islington. By Edward Ballard, M.D. London: J. & A. Churchill. Official Report upon an Outbreak of Enteric Fever at Armley, Leeds, 1873. By the same.

‡ Report on the Sanitary Condition of Leeds for 1872. By M. K. Robinson, M.D., Officer of Health for Leeds.

§ Report to the Health Committee of the Glasgow Police Board on an Outbreak of Enteric Fever at Parkhead. *The Glasgow Herald*, March, 1873.

|| On the Propagation of Scarlet Fever. By Oswald Home Bell, M.D., Professor of Medicine, University of St Andrews. *The Lancet*, 29th October, 1870.

specific physical contagia. Cow's milk consists chiefly of casein or curd, fat, sugar, water, magnesian and calcic phosphates, sodic chloride, potash, &c. The colostrum, or milk secreted for a few days after parturition, differs from normal milk in containing 15 to 25 per cent. of albumen, with less of the other constituents. We have then, in normal milk, a fermentable or putrescent body—casein, and a fermentescible body—sugar. Were the casein absolutely removed from milk, the sugar would remain unchanged, because sugar in aqueous solution only and always ferments by contact with a body fermenting or putrefying. Were the sugar entirely removed from milk, the casein would still putrefy, the cause of which will be explained under the third head. But in the manufacture of cheese, which consists largely of casein, its putrefaction is prevented by the abstraction of water, the exclusion of air, and the rendering of the mass homogeneous by pressure. Milk then, from its proximate chemical composition, must be, and as we know is, eminently prone to decompose. Let us examine briefly the *rationalé* of this decomposition. Milk newly drawn from any herbivorous animal is faintly acid, or neutral, or slightly alkaline in reaction. In the carnivora the milk is said to be always slightly acid. When allowed to stand for a few hours, the fatty matter or cream rises to the surface, which, under the microscope, is seen to consist of highly refracting fat globules, known to have albuminous envelopes.* If the weather be warm, it may be found at the same time that the milk has become acid and coagulated, the sugar converted into lactic acid (by that portion of the casein nearest the surface having become putrid, and acted on the sugar as a ferment), and the casein, being insoluble in an acid solution, ultimately separates in clots and flocci. We have now a markedly acid organic solution to deal with; and as I have clearly proven, in my recent paper on "Putrefiers and Antiseptics," in the *Glasgow Medical Journal* (Nov., 1872, and

* Because agitation of cream with ether does not dissolve the fat; but if a small quantity of potash be added, and it be then shaken with ether, the fat is completely dissolved; the pellicle, which envelopes the globules, having been removed by the action of the potash.

Feb., 1873), all acid organic solutions (if not hyperacid) constitute the most congenial soil for the propagation of fungi. Now, as many hold that zymotic diseases are propagated by cryptogamous spores, it is worth considering whether it is probable that the fungi which appear (generally in about two days) in fermenting milk may at any time be the cause of these diseases.

There are numerous well authenticated cases of serious illness and of death from eating substances otherwise freely used as food, but which seem capable, in certain states of decay of acting as poisons. Amongst these are sausages (that part of the sausage which is fairly putrid being harmless, the internal portions being the most poisonous), all kinds of shell-fish, bacon, the fat near the fins of preserved salmon, herrings, cheese, putrid game, and ox-flesh partially decomposed. Liebig believes the injurious nature of these aliments is owing to the production of a fermenting principle, which operates by causing a kind of fermentation in the body. I need scarcely say, however, that the symptoms produced by the ingestion of these substances bear no typical resemblance to the phenomena of zymotic disease; in fact, they are that of distinct narcotico-irritant poisoning, originating and terminating in the affected individual, and capable of repetition after convalescence. I am not aware of any instance in which milk has caused such symptoms, either in its fresh or fermented state; so that it seems incapable of generating poison in the manner of these substances at least. But that is no reason why it may not generate zymotic poison. What, then, are the facts? A distinguished medical practitioner in Glasgow is actually in the habit of feeding his enteric patients with butter-milk, or, as I should call it, "fungoid milk." Sour milk is also frequently swallowed to allay the thirst in other zymotic diseases. Again, we all know how largely it is used in Scotland as an aliment—the housewife preferring it so decomposed, for preparing home-baked bread, that a little in the mouth makes the teeth stand on edge. Then "Koumiss," so strongly recommended in Phthisis, and

so largely used in Tartary as a beverage, is simply milk which has been made to undergo the vinous along with the lactic fermentation. I think all that can be said against butter-milk is that sometimes it causes pain and acidity in the stomach and bowels with slight diarrhoea, which may be caused by any acid body. But it is to be remembered that the milk which caused the outbreaks of enteric and scarlet fever alluded to, was not fermented but fresh; hence we cannot attribute these to the imbibition of, at least, normal milk fungi, because fresh milk does not produce fungi, and, moreover, as we have seen, milk which does produce fungi, or butter milk, is actually used as an aliment not only in health but also in disease. I hold, therefore, that we have not only no evidence of the generation *de novo* of zymotic contagia in milk; but also none that it ever acts as a narcotico-irritant poison in the manner of sausages, shell fish, &c.

It is probable that bovine colostrum or "beasting milk," which quickly putrefies, might, *per se*, cause severe diarrhoea in the human subject. Medical men know well that human colostrum is a purgative intended by nature for the newly born infant, and the same applies to the first mammary secretion of the lower mammalia. Still, coagulated cow's colostrum is freely swallowed without apparent bad effects. A common practice, in the rural districts of Scotland, is to mix it with flour and bake it into pancakes, which, from the albumen present, taste as if they contained egg.

THE PROBABLE NATURE OF ZYMOTIC POISONS.

These, of course, must either be vegetable, animal, or mineral in their nature, and appear either in a solid, liquid, or gaseous condition. For many obvious reasons it is impossible they can be mineral or inorganic; hence, they must either be vegetable or animal, and, assuming that there are no gaseous nor liquid animals nor vegetables, it follows that they must exist *per se* as solids. Whether vegetable or animal solids, however, it does not follow that they must necessarily be either fungi or microzoa, or both; nor because their normal

conditions are neither gaseous nor liquid, that they are incapable of suspension in air or in fluids. All analogy in the vegetable and animal kingdoms points to fungi and microzoa as the effects, rather than the cause, of the conditions of their *habitat*, and indicates that their functions may be benign rather than malignant. Quite recently Drs Cunningham and Lewis,* in India, have carefully examined the blood of persons suffering from cholera, and failed to find in it either fungi or microzymes, actual or potential; and Dr Beale,† a most distinguished microscopist, and who has devoted great attention to this subject, says that “when bacteria and fungi do appear, they are but harmless concomitants of the disease, and that they cannot be regarded as its cause any more than the vultures which devour the carcase of a dead man can be looked upon as the cause of his death.” Furthermore, “that the active contagious virus does not exhibit the properties of any vegetable or animal parasitical organism yet discovered; neither can any organism, having specific and peculiar characters, be developed from any specific virus.” Hallier,‡ on the other hand, contends that fungi and microzymes are not only the cause of putrefaction, but also of the various kinds of infection, each kind having its own specific microzyme. Micrococci are found by him in every infectious material—in the alvine discharges of diarrhoea, cholera, dysentery, and enteric fever—sometimes slightly, sometimes in vast numbers. In measles, they are found in the sputa, in small-pox and cow-pox in the pustules, in certain fevers in the blood, and there is no disease in which they are so abundant as scarlet fever. As an example of Hallier’s views, he states that cholera in India is caused by swallowing a fungoid organism, urocystis, which constitutes the

* A report of Microscopical and Physiological Researches into the nature of the agent or agents producing Cholera. By T. R. Lewis, M.B., and D. D. Cunningham, M.B. (on special duty), attached to the Sanitary Commissioner with the Government in India. Calcutta, 1872.

† Disease Germs; their supposed nature. By L. S. Beale, M.B., F.R.S. pp. 72, 77, 81.

‡ Gährungserscheinungen, p. 86. Das cholera-contagium: Leipsic, Engelmann, 1867.

smut of rice. He found that by steeping rice in cholera stools, and afterwards sowing it on suitable soil, urocystis was developed, and he concluded that, therefore, the fungus was the cause of cholera. These experiments were suggested by a theory of the cause of cholera, which may be stated as follows:—Cholera originates on the banks of the Ganges, where the rice plant abounds and flourishes. The contagium particles of cholera are manufactured in the cysts of a urocystis, which is parasitic on the rice plant, by the conversion of the protoplasm they contain into microzymes, so that the same material which, when brought into contact with the germinating rice grain produces urocystis, generates cholera when introduced into the intestine.* Dr Lewis, however, easily and effectively overturned Hallier's theory, by showing that urocystis could be successfully cultivated on the dejecta of persons in perfect health. It may further be stated, in confirmation of the view that microzymes do not constitute specific zymotic poisons, that in all cases, where putrefaction is at its maximum stage in infecting matter, the property of infection in the given substance is lost, and in this respect the functions of bacteria are certainly benign.

Zymotic units must be excessively minute, whether composed of living solid particles, or of dead albuminoid putrefacts. Though not gaseous they are capable of being suspended unseen in air, and, though not fluid, they are susceptible of being mixed invisibly in water. According to Dr Burdon Sanderson,† bacteria germs must be less than the 100,000th part of an inch, because in water known to be zymotic they were not seen with the highest powers of the microscope, which is just saying that they only exist inferentially. If particulate, it is certain they must be smaller than a blood corpuscle—that is, less than the 1-4000th of an inch in diameter—because if larger, or of equal size, they could not penetrate the membrane of the pulmonary cells when inhaled, nor the vascular tunics when swallowed,

* 12th Medical Report to the Privy Council, page 249.

† 13th Report of the Medical Officer of the Privy Council, p. 62.

to pass into the circulation; as what keeps the blood corpuscles *in*, must keep particles larger or of equal size *out*. If, however, zymotic contagia consist, as some think, of minute entities of putrid amorphous protoplasm, or, as I should call it, *pathoplasm*, then they need not be so small as a blood corpuscle, because mere contact with the pulmonary membrane, or any moist absorbing surface of a susceptible organism, would be sufficient to initiate, according to the physical theory of Laplace and Bertholet, and to the physico-chemical theory of Liebig* believed in by Bastian,† Beale,‡ and ably differentiated and correlated in all its pathological ramifications by Richardson,§ a specific blood metamorphosis conform to the nature of the primary contagium, which may be that of small-pox, cholera, scarlatina, measles, typhus, typhoid, &c. Still the simple question, What is a zymotic poison? it must be confessed, has still to be answered. The latest solid contribution to our knowledge of the subject has been made by Chauveau, and confirmed by Sanderson.¶ These physiologists have clearly proven that the only part of vaccine and variolous matter which is contagious is the solid particles, which are not larger than 1-20,000th of an inch in diameter, and not the liquid. By an ingenious application of the law of diffusion of fluids, they managed to separate the solid from the fluid parts, and it was found that a child may be vaccinated or inoculated successively with the fluid parts, but without effect, while the most minute portion of the solid parts that can be separated is amply sufficient to originate all the phenomena of the cow-pock or of variola. But, supposing zymotic contagia to consist of minute particles as in the case of vaccine and variolous lymph, we have still to answer, What are these particles? are they vegetable or animal or-

* Liebig's Animal Chemistry, 2d Edition, p. 109.

† The Modes of Origin of lowest Organisms, by H. C. Bastian, M.A., M.D., F.R.S. Page IX. Preface.

‡ Op. cit.

§ Medical Times and Gazette, 29th October, 5th November, 1870.

¶ Intimate Pathology of Contagion. 12th Medical Report to the Privy Council.

ganisms of definite structure, descended from a lineal parentage, and propagating similar or dissimilar offsprings? Or, are they mere simple colloidal structureless atoms—a “leperous distilment” from morbid glands, arising *de novo* under certain conditions? Supposing we give an affirmative to these questions—conceding that some are animals, some vegetables, and some formless albuminous units, of biogenetic and abiogenetic origin,—then we come to water, which seems indeed to have no bottom. How is it that they cause so many distinct specific diseases? How is it that they cause disease at all? How is it that, when they have caused one disease (say typhus), it cannot generally be evoked again in the same organism? How is it that they multiply so enormously in an infected organism? How is it that the specific phenomena of all the zymotica may arise successively in the same individual? and How is it that vaccinia is antagonistic to variola?

We now come to consider the 3rd part, viz.:—

IS MILK A CONGENIAL SOIL FOR THE PROPAGATION OF ZYMOTIC POISON?

Liebig* was the first to show that all ferments possess one character in common, viz.—they all contain nitrogen, but there are certain bodies which contain nitrogen and yet are not ferments, as ammonia and hydrocyanic acid. Casein, however, acts as a ferment, as already stated, on the sugar of milk. Casein, also, in the form of pure curd if exposed to the air soon putrefies, and in this state has also the property of inducing a similar condition in other nitrogenous bodies. The casein acts on them as other such bodies had acted on it. The *rationalé* of this process is “a transformation† or new arrangement of the atoms of a compound yielding two or more new groups, and caused by contact with other substances, the elementary particles of which are themselves in a state of transformation or decomposition. It is a communication or an imparting of a state of motion which the atoms of a body in a state of motion are capable of produc-

* Op. cit., p. 120.

† Op. cit., p. 109.

ing in other bodies whose elementary particles are held together only by a feeble attraction."

It is well known how the mammalian offspring, though receiving no other nourishment than the mother's milk, rapidly increases in weight during the first few months after birth. This proves that milk contains all the elements necessary for building up the tissues of the young animal, and so it does, and that these must also be present in proper proportions and in suitable combinations, and so they are, to be easily assimilated by the tender organs. Milk, then, is simply a solution of the young animal's body as regards the identity of all their chemical elements, and also with reference to most of their chemical compounds. If the foregoing be postulated, it follows that, just as a child or adult is susceptible to be poisoned with small-pox, scarlatinal, or typhoid virus, so also, and in a much higher degree, must milk when exposed to the same influence. Because the living organism has vital force wherewith to oppose the attacks of toxic germs; and just in proportion to the great or little amount of that force contained in the organism will it be able entirely to withstand, or, being infected, successfully to cope with them. But milk is dead organic matter, and, having no *vis vitæ*, must be a much more favourable *nidus* for the nurture of contagia than even a sickly organism. "That milk has also the peculiar property of imbibing various effluvia to a great extent, is well known to those accustomed to dairy management. There are many articles liable to impart a taste and odour to milk; boiled fish is particularly obnoxious to the dairy-maid as being sure to taste the cream and hasten decomposition of the milk. Any meat the least tainted will do the same. Onions, even from another room, will give their taste to milk. So also will paraffin, turpentine from paint, and varnishes, the smoke of tobacco, and the smell of lime from plaster or whitewash."

Furthermore, the additional physical property of fluidity possessed by milk greatly increases its fertility as a zymotic soil. It is familiar knowledge that the presence of moisture is as necessary in fermentation and putrefaction as the

presence of nitrogen. This is well exemplified in many processes for the preservation of animal tissues by the freezing or exclusion of their water, and it is well known that water is a favourite *habitat* of cholera and typhoid poison.

Milk may thus be looked on as a highly favourable soil for the propagation of contagious germs—1st, in respect of the organic matter it contains; and 2nd, in regard to it consisting largely of water. It may be said that there are seven kinds of milk retailed, though most of these must frequently be sold in mixture. 1st, cream; 2nd, sweet, containing a certain percentage of colostrum; 3rd, diseased; 4th, watered; 5th, pure sweet; 6th, skimmed; 7th, buttermilk. I shall only notice some of these specially, and shall refer generally to watered milk in the sequel.

It appears to me that milk mixed with colostrum or “beasting milk,” and diseased milk, or milk from a diseased cow, form more suitable soil for zymotic putrefacts than the other kinds—buttermilk forming the least suitable soil. Colostrous and diseased milk always contain a greater or less quantity of albumen, which is a much more putrescible substance than casein, and may contain epithelium, casts of the lacteal tubes, pus corpuscles, granular debris, and is always markedly alkaline in reaction. Hence it has a greater tendency to putrefy than milk, in which these bodies and that condition are absent. An alkaline medium must be favourable to zymotic vitality, as the blood is alkaline, vaccine lymph is alkaline, variolous lymph is alkaline, and typhoid stools are alkaline. Although I am not aware whether cow-pox pustules have a tendency to appear on the udder at stated periods of the parturient state, still it is obviously not improbable that cow-pox lymph in the form of scurf and crusts from the dried pustules may occasionally be present in milk; but that of course might be considered an advantage, inasmuch as we might be swallowing a zymotic poison and its antidote at once.

It seems to be well authenticated that some of the diseases to which cows are subject may be acquired by man

through swallowing their milk, but a discussion of this point is foreign to our subject.

Amongst the foregoing varieties, butter-milk, as I have said, seems to me the least suitable soil for the preservation or propagation of zymotic entities, and that because of its acidity. Nay, I have a strong impression, derived from the results of experiments which I made lately in regard to the action of various volatile antiseptics on vaccine lymph, that, if milk already contaminated with zymotic germs were allowed to get acid before being swallowed, the acid would suspend indefinitely, or perhaps entirely annul the toxic principle. In these experiments it was found that when vaccine lymph was rendered acid, its peculiar physiological properties were destroyed; in other words, it failed to vaccinate; but when the lymph was alkaline or neutral, its vaccinating powers remained intact. Now, it seems a just conclusion that when acids act thus on vaccine matter, they will also so act on small-pox matter, which, by the way, is the only zymotic poison we can actually see and handle. It is a safe process, however, to experiment with vaccine matter on unvaccinated persons in the manner referred to, because if you succeed in vaccinating, you confer a benefit, and if you fail, no harm is done. It would be a hazardous attempt, however, to render acid some small-pox lymph, and inoculate unvaccinated persons with it; because if it took effect, though it might not actually cause their death, yet it is well known, though inoculated individuals generally have variola in a mild form, they are capable of giving the disease in its most virulent type to others. Hence, they might cause the death of others, and you might get tried for manslaughter. On the other hand, did you fail to inoculate, then it would certainly be a discovery of great benefit to humanity, for which you would likely be mulcted in a heavy penalty, as inoculation is now illegal. But one could then use acid applications to small-pox pustules, and acid fumigations for the abodes of small-pox patients, with a certainty that we were utterly destroying whatever portions of the poison the acid came in contact with.

But it may be said, try the experiment on some of the lower animals. The results, however, would not be reliable. For, though dogs and rabbits, and flies and frogs, and pigeons, mice, and guinea-pigs, are, in the majority of cases, as susceptible to the influence of the metallic and known organic poisons as man, yet certain zymotic poisons, at least, seem to have no effect on them. Quite lately, in Constantinople I think, the excreta of cholera patients, fresh and putrid, were given to pigeons, rabbits, and mice in every possible way without effect. Dr Murchison fed a pig on enteric excreta mixed with its food, yet it fattened and thrived. Many years ago, Professor Andrew Buchanan, of our University, perceiving these difficulties, suggested that Government should offer to condone the punishment of individuals who had forfeited their lives to the laws of their country, on condition that they submit themselves to certain physiological experiments. This idea, in my opinion, should be carried into execution, as thereby exact data could be secured for experiments, the results of which might prove of immense benefit to humanity, and I believe that in its application no group of diseases would present so large a field for experiment, or yield so rich results as the zymotica. But, again, the lactic acid present in butter-milk coagulates any albumen present, and also the casein, the former being also coagulable by heat, while the latter is not. This may be looked on either as an additional reason of the safety of butter-milk as an aliment, or the *rationalé* of its azymotic properties. The caseous and albuminous flakes are separated from the water, which, as I have said, hastens decomposition, while, at the same time, their particles are in a state of cohesion, and hence, to a certain degree, of antiseption.

In regard to cream, presuming it derived from a healthy animal and free from colostrum, it might be deemed at first sight an inimical nidus for contagia, being composed chiefly of oleaginous matter which is destitute of nitrogen. But when it is remembered that the little shut sacculi or cream bags, containing the oily substance, consist of albumen, and

that these and not their contents are exposed to the atmosphere till ruptured by churning, it will be seen that, independent of any casein or water present, cream is only, if at all, exceeded in zymotic fertility by colostrous and diseased milk.

Having now endeavoured to show that zymotic contagia are not generated in milk *de novo*, but at the same time that unfermented milk is a favourable soil for their propagation, I shall now finally consider the 4th head, viz. :—

HOW MAY MILK GET INFECTED WITH ZYMOTIC POISON?

It may get infected—1st. by impure water; and 2nd. by impure air. For many years past, large quantities of milk have been sent from near and distant farms to Glasgow and other large towns. In these farm-yards the manure—human and bovine—is commonly placed in the most convenient situation for deposit and removal. Generally, at a short distance from the manure heap, stands the water-pump. This dangerous juxta-position of ingesta and excreta might not be of much consequence were regard had to the “dip” of the underlying strata (which in Scotland, at least, is seldom horizontal) in determining the safest hygienic position of the well and the “midden.” But as such is not the case, it must frequently happen by chance that the manure is placed exactly so that the fluid which percolates through it will gravitate into the well. Doubtless, however, in some cases, there may be a substratum of brick clay impervious to liquids, or a deep and porous subsoil which will have the effect for a time of oxidizing the organic matter during its passage through it, as in sewage irrigation, and thus to a trifling extent render the liquid innocuous. But this process cannot be permanent, as the best-constructed filters for water-works in course of time have their interstices choked with filtered matter, and require renewal. Many must remember how, previous to the introduction of Loch Katrine water into Glasgow, the water then supplied was frequently muddled with a conglomeration of alluvial debris. Hence it is easily seen how the water in farm wells may get seriously contaminated with putrid

organic matter. This is more likely to take place during a drought, as then the wells frequently get dry or nearly so, and the proportion of organic matter to the water must be much higher than when the well is full; excepting, perhaps, at the beginning of wet weather, which has been preceded by a drought, when the amount of decayed material washed into the soil is greatest. It is unnecessary to say more on this point, as all cases, and they are numerous, of tainted water supply are traceable to one cause, viz.:—the infiltration of organic matter, call it liquid manure, human excreta, or sewage, through some defect in the drains, or from a want of drains, or from the relative situations of the polluting and polluted substances.

A very important question here presents itself in reference to the origin of, at least, enteric fever—namely, whether in order to produce this fever, it is or is not necessary that there must be present the specific excrement of a previous case of enteric fever. That this fever is engendered by its own excremental pollution of air and drinking water is an established fact, but, as I have previously stated, many distinguished physicians are of opinion that it may arise *de novo*. Dr Murchison* cites numerous instances of sporadic and limited epidemic outbreaks of enteric fever, the spontaneous origin of which in sewer emanation, and in contaminated drinking water, was proved to a certainty—there being no proof of previous pollution with enteric excreta. “This,” he says,† “explains why fever arising from sewer emanations is always enteric and not typhus or relapsing fever; why enteric fever is endemic in many places and epidemic in circumscribed localities; why it attacks the rich as well as the poor; why it occurs in isolated country houses as well as in large towns; and why it is most prevalent in autumn and warm seasons.” In the eighth annual report of the sanitary commissioners of the Government of India, recently issued by Dr Bryden, the following occurs:—“What I have shown is, that the spontaneous origin of

* Treatise on Continued Fevers.

† Ibid, pp. 438.

enteric fever is a fact; but that a zymotic element is generated when typhoid is so developed, and that every case of enteric fever should be looked on as a focus from which enteric fever may spread." Premising, then, that typhoid may be elaborated *de novo* in the manner stated, we see that the peculiar conditions favourable to its origin and evolution exist permanently at the very source of a considerable portion of our milk supply, and that, independent of any cases which may occur in the farm-houses themselves. In such an event it is obvious that the danger of infection would be greatly aggravated from the presence of enteric excrement, which all admit contains the special poison in its most virulent form.

It is thus easy to see how the milk may get contaminated with enteric virus. Water from a tainted well may be added to the milk intentionally. But, from all we know of zymotic poisons, a small quantity of such water left in the vessels after washing may be sufficient to infect the milk. In Dr Ballard's* report on the outbreak of enteric fever at Islington—causing 167 cases with 25 deaths, and one at Leeds causing 107 cases with 11 deaths, both traced to the use of impure milk—he has clearly shown that the Leeds outbreak was caused by tainted water mixed with the milk, because, when the handle of the pump which supplied the water was tied, the fever ceased. In the Islington outbreak the balance of evidence points to the milk having been infected by the small quantity of foul water left in the vessels after washing. Dr Ballard says—"I confess that to my mind this is not an impossibility; we all know how small, almost infinitesimal, an admixture of sewage will poison a well or stream. Nor is the idea of reproduction of the typhoid contagium out of, within, or in presence of an appropriate organic material, at all foreign to the prevailing opinion upon the subject. Future experience may show that milk, which has remarkable relations to chemical ferments, is a substance peculiarly adapted also to the reproduction of morbid contagia, or to the contagia of typhoid in particular."

* Op. Cit.

(2.) *By impure air.*—That milk, by exposure to air, suspending certain specific contagia, is capable, for a time at least, of preserving, probably of reproducing, whatever portions of the contagia may settle on its surface, either from the air, or from the bodies of infected persons, so that these may evolve their specific morbid phenomena in individuals swallowing the milk, seems to me sufficiently proven by the outbreak of enteric fever at Parkhead, by the second outbreak of enteric fever at Leeds, by the outbreak of enteric fever at Penrith in 1857, by the outbreak of scarlatina at St Andrews, and also the one of scarlatina at Leeds. My excellent and esteemed friend, Dr Russell, officer of health for the city, clearly demonstrated the foregoing in his report on the Parkhead outbreak. Many eminent authorities are of opinion that enteric fever is not infectious in the sense that small-pox is. Others hold that the alvine dejections constitute the chief, if not the sole medium of communication. Be that as it may, Dr Russell has proven (I need not go into details, his report is so recent), that individuals may contract the fever who have not inhaled the emanations directly from enteric excreta,—who have not been exposed to the exhalations of an enteric patient's lungs or skin,—who have not swallowed enteric water, nor respired enteric sewer gas, but, who have partaken of milk rendered zymotic by exposure in the vicinity of a typhoid patient. Of the Leeds outbreak, Dr Robinson,* the officer of health, gives, in his last annual report (1873), the following remarkable details which I have abridged:—"A farm-house in the country became infected with typhoid fever in September last. The head of the house died, and subsequently five members of the household suffered from the disease. Milk, from this infected source, is supplied by a dairyman to a respectable district of the town, where a virulent outbreak of typhoid takes place, and eighty persons who obtained their milk from this dairyman contracted fever, fourteen of whom died. No fever existed at the milk-vendor's house when the cause of the outbreak was found (though subsequently his daughter took

* Op. cit.

typhoid). The farm is visited, the water is found blameless, being obtained from a source at a higher level than the house, and analysis showed it pure. In the house itself the sick were placed in a room communicating with the kitchen and dairy. Those engaged with the milk attended the sick. Unclean linen was observed placed side by side with the lids of the milk-cans. Outside, an immense fluid reeking mass of manure adjoined the stable where the cows were milked, on to the surface of which the drain from the kitchen sink and slope stone poured its contents. The common privy, which received the typhoid excreta, was overflowing and draining. Thus innumerable particles of poison must have been floating around the house, and from their close contiguity, permeating the cow stable, in which vicinity the milk remained till sent away." This, Dr Robinson thinks, is sufficient to show not only the possibility, but the almost certain probability of the sad results which followed. It seems to me worthy of remark that Dr Robinson found those who habitually took milk, or large quantities of cream in their tea or coffee, to suffer from the fever. This proves what I have before stated, that cream is a suitable nidus for zymotic poison, and also that the poison is not destroyed by the usual temperature of hot infusions of tea or coffee. I would further remark that it is highly probable the cause of the fever breaking out in the farm-house originated in the polluted condition of the farm-yard.

As regards the Penrith outbreak, it may be summed up as follows:—A girl is sent home ill with typhoid. She infects other two of the family. The mother is the sole attendant. A byre adjoined the house. The mother milks the cows. The milk is brought into the apartment where the sick children lie. By and by it is taken out in tin measures for distribution amongst the customers, who in most cases contract the fever from drinking the milk.

I shall offer no comment on these three outbreaks. They speak for themselves.

In regard to the propagation of scarlatina by milk,

Professor Bell, of St Andrews, has shown* to a certainty that 26 cases occurred, with two deaths, from swallowing milk mixed with portions of desquamated cuticle. The person who milked the cows had the disease, and was nursing others also ill with scarlatina.

Dr Robinson, in the report already referred to, states that in one locality in Leeds, 21 children were attacked by scarlet-fever, who, previous to, and during the time they were attacked, were supplied with milk from a house where several children were ill of scarlatina. A peculiar feature in the history of these cases was, that the children were stricken simultaneously, so that, in whatever mode the poison was introduced, it found its way at one and the same time, and was not in the respective houses, communicated from child to child.

I was not aware till lately that small-pox and cholera seemed to have been communicated to persons through the medium of milk. In a lecture on zymotic diseases, delivered at Dublin in March last by Dr Grimshaw, this fact was merely stated. I wrote to Dr Grimshaw for particulars. These he kindly gave as follows:—

“My grounds for believing that cholera has been spread by milk are—1st, That an epidemic which arose in this city seemed to exclude every other source of infection. 2nd, That a great many dairy shops in the poorer part of the town were surrounded by little groups of cholera cases, and in nearly all these, the dairy shop itself had had a case in the house. This information I made out from a list of cholera localities kept by Dr Mapother, the health officer for the city. 3rd, The one case that I happened to know, that a certain dairy about ten miles from this sends out milk in carts, but has also a dairy shop in the neighbourhood. The water from a particular pump was used by the people in the dairy shop, and probably put into the milk. This pump was in the immediate vicinity of the shop, but of course milk supplied direct from the yard would not be watered by this pump. Persons who drank water from this pump took cholera, and several died of it. Several who did not get water from the pump, but bought milk at the dairy shop, got cholera, and died of it; and there was cholera in the dairy shop. My own family, and those of several of my acquaintance, were supplied with milk from the carts from the yard; none of them, as far as I know, were affected by cholera. These state-

* Op. cit.

ments are from memory, as the epidemic was not carefully noted at the time. That small-pox may be conveyed in a similar manner can scarcely be doubtful. I know that numbers of dairies were invaded by the epidemic, and that the customers in some instances said they believed they got small-pox from the milk, and certainly many dairymen were ruined in consequence."

It is, however, obvious that the mere proximity of milk to ærial contagia, or mixture with a small quantity of water impregnated with the poison, might be of little consequence, were it not that it constitutes a congenial soil for their multiplication. Admit this proposition, and the rest follows. Every medical practitioner knows, and can furnish ample proof, how inconceivably subtle contagious or infectious media are. I remember once visiting a young girl residing with her parents in the classic grounds of Ballochmyle. I found her suffering from scarlet-fever. Of all the spots on earth one would have thought this the last in which contagion should be lurking, and the question was, How did she get it? She got it thus:—Workmen were repairing the mansion-house. One had a boy whom I had recently attended for scarlet fever. This boy one day brought his father's dinner from Catrine, about half-a-mile distant. The girl and boy, previously acquaint, happened to meet. They amused themselves a short time on the lawn, and about a week after she took the fever, and gave it also to her brother.

If it be postulated that milk is a congenial zymotic soil, we know that, like all such soils, it will be sure to produce a very large crop from a very small quantity of seed. Hence our care should be to keep the seed from the soil, and the soil from the seed. Practically, however, this, though comparatively easy in farm-houses, must be a work of difficulty in large towns. In Glasgow, for example, as Dr Russell has said, "It is very common for parties to live and rear families in rooms behind shops through which the sole access lies, and in which groceries, milk, provisions, fruit, sweatmeats, &c., are sold; and when infectious disease enters such a family it cannot fail to be the source of quite peculiar risk to the public." I need hardly say that I un-

hesitatingly endorse this statement, and may add that many of the articles sold in such places—as ham, cheese, fish, &c.—from their composition are likely to form suitable zymotic *habitats*, though in some cases the poison may be destroyed by subsequent cooking. At anyrate, it has been shown that milk—which, of course, requires no cooking—is favourable to the preservation, and doubtless also to the reproduction, of enteric, scarlatinal, and I think we may safely include choleraic contagia; such being the case it is extremely probable, in fact I should say certain, that it is also as favourable to the preservation and reproduction of the individual poisons of measles, small-pox, typhus, &c.

To isolate the specific principle of contagia synthetically or analytically, to study their natural history, their physical properties, their chemical affinities, to discover suitable preventives and sure antidotes, is a task which many have undertaken, but hitherto have almost entirely failed in accomplishing. Besides being of absorbing and unflagging interest to the hygienist, biologist, and pathologist, it is one of immense importance to the human race. In England alone the zymotica cause above 100,000 deaths annually, and though their excessively attenuated atoms have hitherto practically eluded the most refined methods of research, failing to be ensnared by the most subtle and delicately-contrived experiments, still I cannot but think that, with higher microscopical powers, greater facilities for original experimental investigation, increased and more exact knowledge of physiological and pathological chemistry, assisted by fresh discoveries in the various allied sciences, their total subjugation to the will of man is simply a question of time.

V.—CLINICAL REPORT OF CASES TREATED IN THE SURGICAL WARDS OF THE GLASGOW ROYAL INFIRMARY DURING 1872.

By GEORGE H. B. MACLEOD, M.D., F.R.S.E., *Professor of Surgery, University of Glasgow; Surgeon to, and Lecturer on Clinical Surgery, Royal Infirmary.*

THE year 1872 was a very busy one within the surgical wards of the Infirmary, as our accommodation, considerable as it is, was on many occasions barely sufficient to meet the ever-increasing wants of the city. From innumerable workshops and mines, and from our extensive port and far-spreading network of railways, an ever-augmenting flow of wounded persons is being brought day after day; while a large circle of surrounding country, with teeming towns and villages, send to our wards almost every form of surgical affection. In this way, Glasgow, as a Clinical School is, so far as my observation has extended, almost unrivalled. There is presented to the observation of the student a continued series of those ailments and accidents which he hears described in the class-room, and he has thus an opportunity of correcting and supplementing the information there obtained from the living pictures in the wards. The pathological department is now also so well organised that any one desirous of learning has every opportunity afforded him.

During the year, 788 cases in all were treated in my wards—150 being out-door. I had in all 26 deaths, so that my mortality was not quite 3·3 per cent., being the lowest death-rate I have yet had. This most favourable result, it may be seen from the appended table of cases treated, did not arise from the diminished severity of the accidents admitted, but was chiefly due to the admirable hygienic condition of the wards throughout nearly the whole year. I have never seen less of septicæmia and erysipelas in the Infirmary than during 1872.

The following table of the fatal cases will show at a glance that not a few of them were in a hopeless state when admitted, and that, in fact, they were received into the house merely as an act of humanity:—

TABLE OF FATAL CASES.

Age, 17.—*Double pneumonia and thoracic fistula.* Dying when admitted. Rallied for a few days. Both lungs disorganized, and one thoracic cavity full of pus.

Age, 20.—*Advanced kidney disease and suppression of urine.* Sent up from the country as hip joint disease.

Age, 15.—*Deep burn ("4th degree") of face, chest, abdomen, and left arm. Several ribs broken, also lower jaw. Arm torrifed.* Fell between red-hot rollers. Mangled and burned. Could not be touched for days.

Age, 23.—*Strangulated femoral hernia reduced by taxis—loop found strangulated on opposite side by omentum.* A very curious case, related further on.

Age, 27.—*Smash of left leg by railway wheel, followed by prolonged hæmorrhage.* Lay long bleeding before he was assisted. Collapse long continued, and profound. Amputation at secondary period in thigh. Died of septicæmia a fortnight after.

Age, 19.—*Complete smash of arm by a railway wheel.* Would not allow amputation till gangrene and sinking had set in. Removed at shoulder. Died of blood poisoning six days afterwards.

Age, 18.—*Died under chloroform administered by a dresser.* It was during my absence in autumn. A growing, weak lad.

Age, 24.—*Fracture of spine.* A case of manslaughter, for which his assailant was condemned.

Age, 29.—*Leg and thigh destroyed by a railway wheel. Other limb also injured.* Almost nothing could be done. His whole body was crushed. Never was in a state for amputation.

Age, 36.—*Compound dislocation of ankle; extensive and severe bruising.* Astragalus was nearly extruded from the wound, as it was torn entirely from its connections. It was removed, and an attempt made to preserve the limb. When this had manifestly failed, he refused to allow amputation to be performed till all hope of success had passed.

Age, 6.—*Excision of the head of the femur in advanced joint disease.* This was performed by one of my colleagues during my absence, and I have no details. Sank nine days after.

Age, 56.—*Complete charring of the head—soft parts and bone.* An epileptic, who fell head foremost into a furnace. Skull necrosed. Lived for nearly three weeks.

Age, 23.—*Crush of foot by the fall of a mass of iron; late amputation.* Diffuse suppuration and hectic. Free counter-openings and support futile. Would not consent to amputation till signs of septicæmia were so decided that I amputated his limb with the greatest hesitation. He died next day.

Age, 21.—*Crush of little finger, leading to amputation of forearm.* An out-door case, which was at first of a trifling character, but led on to phlegmonous erysipelas, and blood-poisoning.

Age, 41.—*Compound comminuted fracture of left femur, and similar injury to leg. Crush of the trunk, and especially of abdomen and back.* Occasioned by the fall of a stone 5 tons in weight. For some time all that could be done was to soothe his sufferings, but his general state improved so as to allow his shattered limb to be removed. For a month he seemed to do well, but finally sank from exhaustion, and probably blood-poisoning.

Age, 29.—*Chronic strumous abscesses of large size, especially in abdomen and thigh.* A hopelessly-diseased scrofulous subject, who was sent into the house to die.

Age, 15.—*Acute periostitis of humerus and tibia, with large acute abscesses in various parts.* Lived only a short time after admission. Nothing could be done for him.

Age, 21.—*Disease of knee joint. Amputation in thigh.* Old disease undergoing recent aggravation, and ending in diffuse suppuration. General health much impaired. Had secondary hæmorrhage after operation.

Age, 59.—*Femoral hernia. Operation.* A weakly old woman. Strangulation for nine days, and stercoraceous vomiting for four. In last stage of weakness. Referred to again.

Age, 8 months.—*Spina bifida.* Punctured with small trocar, and afterwards seton used. Suppuration followed, child collapsed, and died four days after first interference. The communication with the spinal canal would hardly allow a probe to pass, and the cord was in no way affected.

Age, 67.—*Enlarged prostate, cystitis, and kidney disease.* Was much lacerated and severely bled before admission in futile attempts to pass a catheter. He had suppuration in the prostate after coming into the house, and died from exhaustion.

Age, 65.—*Concussion and laceration of brain.* A very feeble man, who for some time could not walk without aid. He fell down a long stair on his face. Never fairly rallied.

Age, 50.—*Fracture of base of skull.* Lived only two days.

Age, 55.—*Rupture of the bladder.* A very curious case.

Age, 14.—*Rupture of urethra and neck of bladder. Ankle joint opened, and other injuries.* Fell 20 feet astride of an iron plate, forming part of a brazier containing a fire. He was severely burned.

Age, 29.—*Extravasation of urine.* Had stricture, and urethra gave way during coitus. Was not sent into the house till he was beyond help. No incisions had been made, and he was sinking.

Such is a short record of the fatal cases during the year, and it will be at once seen how impossible it was to save the great majority of them. Several could hardly be touched, so terrible were their injuries, and the little which could be suggested to soothe their sufferings constituted the only attention they received.

The operations performed during the year in my service will be found in the following table:—

TABLE OF OPERATIONS.

| Nature of Operation. | Primary. | Secondary. | Result. | |
|---|----------|------------|------------|-------|
| | | | Recovered. | Died. |
| Amputation at Shoulder Joint, ... | 1 | ... | ... | 1 |
| “ close to do., ... | 1 | ... | 1 | ... |
| “ in Upper Arm, ... | ... | 3 | 1 | 2 |
| “ in Forearm, ... | 2 | 1 | 3 | ... |
| “ of Hand, ... | 2 | ... | 2 | ... |
| “ partial do., ... | 2 | ... | 2 | ... |
| “ of Fingers, ... | 14 | ... | 14 | ... |
| “ in Thigh, ... | ... | 8 | 5 | 3 |
| “ through Knee, ... | ... | 1 | 1 | ... |
| “ in Leg, ... | ... | 1 | 1 | ... |
| “ at Ankle, ... | ... | 6 | 6 | ... |
| “ partial of Foot (Hey's), ... | ... | 1 | ... | 1 |
| “ of Toes, ... | 2 | 4 | 6 | ... |
| Excision of Growths, ... | ... | 6 | 6 | ... |
| “ of Mamma, ... | ... | 2 | 2 | ... |
| “ of part of Clavicle, ... | ... | 1 | 1 | ... |
| “ of Lip, ... | ... | 3 | 3 | ... |
| “ of Tonsils, ... | ... | 1 | 1 | ... |
| “ of Nævi, ... | ... | 2 | 2 | ... |
| “ of Tongue, or part of, ... | ... | 3 | 3 | ... |
| “ of Upper Jaw, ... | ... | 3 | 3 | ... |
| “ of Head of Femur, ... | ... | 1 | ... | 1 |
| “ of Knee Joint, ... | ... | 1 | 1 | ... |
| “ of Elbow Joint, ... | ... | 2 | 2 | ... |
| “ of Metatarsal Joint of Great Toe, ... | ... | 1 | 1 | ... |
| “ of Metatarsal Bone, ... | ... | 1 | 1 | ... |
| Ligature of Large Nævi, ... | ... | 2 | 2 | ... |
| Rupture of Stricture of Urethra, ... | ... | 12 | 12 | ... |
| Fistula in Ano, ... | ... | 6 | 6 | ... |
| “ in Perineo, ... | ... | 1 | 1 | ... |
| “ Vesico-vaginal, ... | ... | 1 | 1 | ... |
| Hernia reduced by Taxis, ... | ... | 2 | 2 | ... |
| “ operated on, Inguinal, ... | ... | 2 | 1 | 1 |
| “ “ Femoral, ... | ... | 3 | 2 | 1 |
| Lithotomy, ... | ... | 1 | 1 | ... |
| Ligature of Vessels of Fore-arm, ... | ... | 1 | 1 | ... |
| Perineal Section, ... | ... | 1 | 1 | ... |
| Removal of Epithelioma from Face, ... | ... | 4 | 4 | ... |
| “ “ below Tongue, ... | ... | 1 | 1 | ... |
| Circumcision, ... | ... | 7 | 7 | ... |
| Ligature of Piles, ... | ... | 2 | 2 | ... |
| Removal of Sequestra, ... | ... | 8 | 8 | ... |
| Chieloplastic, ... | ... | 2 | 2 | ... |
| Hydrocele, ... | ... | 4 | 4 | ... |
| Tracheotomy, ... | ... | 1 | ... | 1 |
| Opening large Lumbar Abscesses, ... | ... | 2 | 2 | ... |
| “ long sinuses, ... | ... | 2 | 2 | ... |
| Removal of cicatrices, ... | ... | 2 | 2 | ... |
| Trephining Tibia, ... | ... | 1 | 1 | ... |
| Tenotomy, ... | ... | 2 | 2 | ... |
| Plastic operation on Eyelid, ... | ... | 1 | 1 | ... |
| “ “ on Perineum, ... | ... | 1 | 1 | ... |

Thus, excluding many trifling operations of which no record was kept, 148 operations were performed, and of these 11 died, or 7·4 per cent. Reference was made in the former table to all the fatal cases.

We have in the Hospital frequently to observe the wide-spread and terrible destruction occasioned by railway wheels, which resembles very closely the effects of round-shot. The violence of the shock, the large amount of blood lost, and the nearness to the trunk at which amputation has usually to be performed, in order to get beyond the splitting of the bones and the crushing of the soft parts, combine to render these cases very fatal. In no patients are the moral and physical evil influences which result from sudden, unlooked-for injury more evident than these. A considerable proportion of the wounded sent to us suffer from multiple injuries, and in this way it is not always easy to anticipate their combined influence. We have constantly to deplore the foolish practice of keeping patients under treatment till fatal symptoms have appeared, and then sending them into Hospital to die. Such removal, in not a few cases, only accelerates the inevitable result.

The next Table presents an epitome of the affections treated during the year, and will serve to show what a variety of ailments are admitted into our wards.

TABLE OF CASES TREATED.

| <i>General Diseases.</i> | | | | <i>Digestive Organs.</i> | | | |
|---------------------------|-----|-----|----|------------------------------------|-----|-----|----|
| Syphilis, Primary ... | ... | ... | 31 | Post-Pharyngeal Abscess ... | ... | ... | 1 |
| “ Secondary ... | ... | ... | 13 | Enlarged Tonsils ... | ... | ... | 1 |
| “ Tertiary ... | ... | ... | 8 | Stricture of Œsophagus ... | ... | ... | 1 |
| Cancer of Face ... | ... | ... | 4 | Reducible Hernia ... | ... | ... | 2 |
| “ of Lips ... | ... | ... | 3 | Strangulated Oblique Inguinal | | | |
| “ of Jaws ... | ... | ... | 7 | Hernia ... | ... | ... | 2 |
| “ of Tongue ... | ... | ... | 7 | Strangulated Femoral Hernia ... | ... | ... | 4 |
| “ of Floor of Mouth ... | ... | ... | 2 | Fistula in Ano ... | ... | ... | 6 |
| “ of Testicle ... | ... | ... | 1 | Hæmorrhoids ... | ... | ... | 5 |
| “ of Rectum ... | ... | ... | 1 | Abdominal Tumours ... | ... | ... | 1 |
| “ of Vagina ... | ... | ... | 1 | <i>Diseases of Urinary System.</i> | | | |
| “ of Leg ... | ... | ... | 1 | Calculus in Bladder ... | ... | ... | 1 |
| “ of Mamma ... | ... | ... | 8 | Suppression of Urine ... | ... | ... | 1 |
| Non-Malignant Growths ... | ... | ... | 11 | Hæmaturia ... | ... | ... | 1 |
| <i>Nervous System.</i> | | | | Incontinence of Urine ... | ... | ... | 1 |
| Spina Bifida ... | ... | ... | 1 | Retention of Urine ... | ... | ... | 12 |
| Irritable Stump ... | ... | ... | 2 | Enlarged Prostate ... | ... | ... | 8 |
| Tetanus ... | ... | ... | 1 | Gonorrhœa ... | ... | ... | 22 |
| Injury of Nerves ... | ... | ... | 1 | Orchitis ... | ... | ... | 15 |

TABLE OF CASES TREATED—*Continued.*

| <i>Diseases of Urinary System—Contd.</i> | | | | <i>Injuries—Continued.</i> | | | |
|--|-----|-----|----|---|-----|-----|----|
| Phymosis | ... | ... | 5 | Scalp Wound | ... | ... | 11 |
| Paraphymosis | ... | ... | 3 | Concussion of Brain | ... | ... | 4 |
| Bubo | ... | ... | 20 | Fracture of Skull, Vertex | ... | ... | 2 |
| Condylomata | ... | ... | 3 | “ of Base | ... | ... | 1 |
| Stricture of Urethra | ... | ... | 11 | “ of Lower Jaw, Compound | ... | ... | 1 |
| Urinary Fistula | ... | ... | 2 | “ of “ Simple | ... | ... | 2 |
| Perineal Fistula | ... | ... | 4 | “ of Ribs | ... | ... | 5 |
| Hematocele of Testicle | ... | ... | 1 | “ of Spine | ... | ... | 1 |
| Extravasation of Urine | ... | ... | 2 | | | | |
| Varicocele | ... | ... | 3 | <i>Upper Extremity.</i> | | | |
| Syphilitic Testis | ... | ... | 1 | Fracture Compound of Shaft of | | | |
| Malignant “ | ... | ... | 1 | Humerus | ... | ... | 1 |
| Hydrocele | ... | ... | 3 | Fracture, Simple, of Shaft of Humerus | ... | ... | 6 |
| Vesico-vaginal Fistula | ... | ... | 2 | “ “ of Surgical Neck | ... | ... | 4 |
| Rupture of Bladder | ... | ... | 1 | “ Green-stick, of Shaft | ... | ... | 1 |
| Tumour of Labia | ... | ... | 1 | “ of Glenoid Facet | ... | ... | 1 |
| | | | | “ Compound, of Fore-arm | | | |
| <i>Diseases of Spine and Organs of</i> | | | | Bones | ... | ... | 1 |
| <i>Locomotion.</i> | | | | “ Simple “ | ... | ... | 10 |
| Periostitis | ... | ... | 2 | “ Vicious Union of “ | ... | ... | 1 |
| Abscess in Tibia | ... | ... | 1 | “ Compound of Metacarpus | ... | ... | 2 |
| General Rickets | ... | ... | 1 | “ Simple “ | ... | ... | 1 |
| Necrosis of various Bones | ... | ... | 17 | “ Simple, of Carpus | ... | ... | 2 |
| Caries of Carpus and Tarsus | ... | ... | 10 | “ “ of Fingers | ... | ... | 9 |
| Synovitis of great Joints | ... | ... | 10 | “ “ of Radius | ... | ... | 14 |
| Arthritis of Elbow | ... | ... | 4 | “ “ of Clavicle | ... | ... | 13 |
| Morbus Coxæ | ... | ... | 14 | “ “ of Olecranon | ... | ... | 1 |
| Arthritis of Knee | ... | ... | 5 | Dislocation of Thumb | ... | ... | 1 |
| “ of Ankle | ... | ... | 6 | Dislocation of Humerus into | | | |
| Disease of Spine | ... | ... | 10 | Axilla | ... | ... | 9 |
| Thecal Abscess | ... | ... | 3 | Dislocation of Fore-arm Bones | | | |
| Talipes Equino-varus | ... | ... | 2 | Backwards | ... | ... | 1 |
| Bursitis | ... | ... | 1 | | | | |
| Elephantiasis of Leg | ... | ... | 3 | <i>Lower Extremity.</i> | | | |
| | | | | Sprain of Ankle Joint | ... | ... | 7 |
| <i>Disease of Cellular Tissue.</i> | | | | Compound Dislocation of Leg Bones | ... | ... | 1 |
| Cellulitis | ... | ... | 1 | Compound Fracture of Femur | ... | ... | 2 |
| Phlegmonous Erysipelas | ... | ... | 1 | Simple “ “ | ... | ... | 15 |
| Abscess, Large | ... | ... | 18 | Vicious Union in Femur | ... | ... | 2 |
| “ Psoas | ... | ... | 1 | Green-stick Fracture in Femur | ... | ... | 2 |
| “ Iliac | ... | ... | 1 | Fracture of Acetabulum | ... | ... | 1 |
| “ Lumbar | ... | ... | 3 | Fracture of Patella (transverse) | ... | ... | 2 |
| Sloughing Sores | ... | ... | 3 | Compound Fracture of Both | | | |
| <i>Disease of Cutaneous System.</i> | | | | Leg Bones | ... | ... | 9 |
| Simple Erysipelas of Head | ... | ... | 3 | Simple Fracture of both Leg | | | |
| “ of other parts | ... | ... | 1 | Bones | ... | ... | 14 |
| Cancrum Oris | ... | ... | 1 | Green-stick Fracture of both | | | |
| Frost Bite | ... | ... | 1 | Leg Bones | ... | ... | 1 |
| Ulcers | ... | ... | 53 | Simple Fracture of Tibia | ... | ... | 4 |
| | | | | “ of Fibula | ... | ... | 11 |
| | | | | Pott's Fracture | ... | ... | 5 |
| | | | | Compound Fracture of Bones | | | |
| | | | | of the Foot | ... | ... | 10 |
| | | | | Smash of Toes | ... | ... | 3 |
| | | | | Smash of Bones of Foot | ... | ... | 2 |
| | | | | Compound Dislocation of As- | | | |
| | | | | tragalus | ... | ... | 1 |
| | | | | Gangrene (Embolism) of Leg | ... | ... | 1 |

I should desire, in the remainder of this paper, to make a few remarks on a selection of the above cases.

The compound fractures of long bones which are admitted into our hospital are, as a rule, very severe, and most anxious cases. A large proportion of the sufferers are bad subjects for such a protracted ordeal as the repair frequently proves, and the great violence to which the bone has, in most cases, been subjected, and the complications which attend the fracture, make it often very hazardous to attempt their preservation. Still in no department of surgery has greater improvement been made of late years than in the management of these cases. For them the antiseptic treatment has accomplished wonders, and, when it can be fairly carried out, success is the rule, and failure the exception. Few things tend to destroy the hope of recovery more than when these unfortunate people are brought from a distance in rough, jolting vehicles, the fragments often ill-adjusted and badly secured, and not unfrequently active hæmorrhage going on. By the time they reach the hospital, the collapse is profound, and so much laceration has been brought about within the tissues of the limb that no treatment is of any avail. The very large majority of those who meet with such accidents in Glasgow are Irish, and that probably because of their want of skill as labourers, or, still more, from their being so often put to the more dangerous employments. The most difficult questions frequently arise regarding the management of these fractures, as the success which so generally crowns the use of carbolic acid is apt to induce us to undertake what is beyond our art, while, on the other hand, the grave, momentous interests at stake—limb, possibly life—make one hesitate to amputate when perhaps procrastination is fatal. He is a sorry surgeon who is not often disquieted by the solution of this question.

During the year, two bad compound fractures of the femur were treated. One recovered, and one had to be amputated.

Nine cases of compound fracture of both bones of the leg were received, and, of these, two smashed by railway wheels had to be amputated. The rest recovered perfectly.

Ten compound fractures of the metatarsal bones recovered. One case of compound fracture of the humerus and one of the fore-arm bones also recovered. Except in the case of railway injuries, it is, I think, now the exception to amputate for compound fracture of the bones of either extremity. This is very different from the practice of twenty years ago.

The cases of herniotomy during the year were very unfavourable ones as a whole. The oft-told story of neglect in seeking medical aid, or delay in sending the patient into the house for operation, was the chief and almost only source of the mortality. In one case strangulation had been present for ten days, and stercoraceous vomiting for half that time, and yet twenty-four hours before she was sent to us, a "double strong" dose of salts and senna had been administered by orders of a medical man.

CASE I.—A., male, aged 23, engineer. In lifting a great weight, sudden protrusion into the right femoral canal took place about fifty-four hours before he came into the hospital. The strangulation was very complete, and his condition most urgent. Vomiting had occurred for twenty hours, and he was much collapsed and pained. A futile attempt at reduction had been made outside without chloroform. I had little difficulty in effecting replacement when he was anæsthetised. A pad and bandage were applied in the usual way. A partial reproduction occurred during the night as he rose, against orders, to go to the water closet. This was put right, but his symptoms did not abate. I felt convinced that the constriction had been relieved when the taxis was used, yet, as his condition was most critical, an exploratory operation was performed, and no explanation found of his depressed state. He died during the second night, and it was found on examination that a portion of bowel was strangulated on the opposite side of the abdomen from that operated on. A knuckle of intestine had there become constricted by a loop of omentum. That which had descended into the femoral canal was found congested, but free, in the abdominal cavity. It was evident that both strangulations had occurred at the same time, and as a result of the same violence. The sensation

communicated to the hand while the taxis was applied, and the state of the ring afterwards, plainly showed that reduction had been properly and fairly accomplished.

CASE II.—Aged 55, female cook. Had suffered from reducible right femoral hernia for years, and always wore a truss. Thirty-seven hours before admission, having temporarily laid aside her truss, protrusion took place, and could not be returned. One attempt to reduce it without chloroform was made by a surgeon of the town, and, as he failed, she was sent to the hospital. On admission, her state was favourable. There was no vomiting, but she had nausea. There was little pain in the belly. The hernia was small, firm, and slightly painful. One trial of the taxis under chloroform having failed, I operated, not opening the sac. The strangulation was at Heys ligament. It was easily set right. For six days she went on most successfully. The wound was all but healed, and her bowels had acted spontaneously. She rose to sit at the fire, though warned not to do so, and felt a small escape take place into the canal. I was out of town, and there was some delay in obtaining the attendance of one of my colleagues, who thought that no real protrusion had occurred, and that it was only the patient's fancy. Vomiting began, and 24 hours were allowed to pass before the wound was re-opened and the bowel replaced—the sac being opened. Peritonitis followed, and, to my great annoyance, I found her dead on my return home. No post-mortem was allowed.

CASE III.—Aged 24, sailor. Had reducible left oblique inguinal hernia for years. Testicle not descended on that side. Strangulation for 17 hours. No violent symptoms. Taxis failed outside. Sac opened at operation, and bowel and omentum found in it, and easily returned. Wound treated antiseptically, and healed quickly.

CASE IV.—Female, aged 68. Left femoral. Had reducible hernia for 15 years. Strangulation for many days, but could not say exactly how long. There had been persistent vomiting for two days. Abdomen tense and painful. Protrusion large, and having more than the usual upward

and outward disposition. The taxis failing, herniotomy was performed, and the sac opened. Reduction was easily effected, and she made an uninterrupted recovery.

CASE V.—Female, aged 59. Left femoral hernia. Almost dead on admission. Strangulation for ten clear days, and stercoraceous vomiting for five days. She had never suffered before from hernia. Repeated attempts had been made outside to reduce it, and now the tumour (which is small and tense) is inflamed and very tender. The abdomen is tympanitic and painful, and the aspect sunken, pinched, and ghastly. She had been made to swallow a large quantity of purgative medicine, and the day before admission had a double-strong dose of salts and senna administered. I operated at once, though the case was almost hopeless. She stood the ordeal well, and next day felt so much improved as to demand full diet. Her aspect had quite changed, her pulse was 96, and of good strength. Sickness had ceased, and the surface was of natural heat—the vomiting and the distension of the abdomen, and the pain were nearly gone. At dinner, she surreptitiously obtained some potatoes from the patient in the bed next to her. This produced flatulence, and the sickness and vomiting returned, and she rapidly sank and died next day. As there was some fulness at the wound, and I was afraid strangulation might have been reproduced, I opened up the wound when the symptoms recurred; but, except a small mass of fat, with a healthy portion of bowel somewhat wrapped up in it (but not strangulated), which lay within the wound, and which I hooked down and unfolded, I found nothing. It was discovered, on *post mortem* examination, that the part of the bowel which had been the seat of constriction was the sigmoid flexure, and that it had been strangulated by a long slender band from the omentum. The constriction had been relieved, but the bowel had not unloaded itself, and there was a small patch of peritonitis found near the wound.

One or two cases, illustrative of other affections, may be added.

A girl, aged 13, was admitted in May with *disease of her heel*. She was a delicate strumous girl, with various abscesses and ulcers on different parts. An unhealthy sore occupied the prominence of her left heel, and from it protruded the "tuber calcis" quite dead. By slightly enlarging the orifice, I was able to withdraw the os calcis entire, and without the loss of almost a drop of blood. The periosteum was all left, much thickened and rough inside with minute spiculæ of bone. The wound soon closed, and when she left the hospital, two and a half months afterwards, the shape of the heel was almost entirely reproduced by firm new bone. It may be added that, from having been long confined to bed by her ailment, both legs were much contracted, but under chloroform they were brought down, some adhesions at the knee-joints having to be broken up.

Death from Chloroform.—This occurred during my absence in autumn. The administration was conducted in the usual way by one of the dressers. The house-surgeon was standing near, as he was about to apply nitric acid to a spreading ulcer of the leg. The patient was a weakly-growing cachectic lad whom I had several times safely anæsthetised before. He died suddenly after a little struggling, evidently from syncope. This accident is a very rare one in our hospital, and never before occurred in my wards. Believing as I do in the necessity of watching most closely both the respiration and pulse, I am in the habit of exposing the pit of the stomach while chloroform is being given, so that standing, even some way off, I can easily observe the breathing, and also the heart's impulse. The colour of the lips (dark or pale) is also a most admirable guide, and should be carefully looked at every now and again. In Glasgow, we always use the towel, believing more in the intelligent action of an instructed assistant than in any machine, however ingenious. The induction is made very gradually, and special care is taken if there is much struggling. Any pallor at once causes the cloth to be withdrawn, and if it becomes excessive, and the heart's action threaten to fail, the head is lowered (possibly drawn downwards off the

table), and the limbs are raised, the cheeks smartly slapped, artificial respiration employed, a current of cold air allowed to play on the face and chest, smelling salts applied to the nostrils, and a flannel wrung out of hot water put to the præcordium. When, on the other hand, the lips and face get livid, and the respiration stertorous or impeded, then the tongue is drawn forward, cold water dashed on the face, and artificial respiration resorted to. I mention these things as there has been much discussion lately in some of the professional journals regarding the best means of resuscitation, and in many cases the improbability of being provided with many of the means recommended is usually overlooked. The measures above recounted have served to revive all those whom I have seen at any time in danger from chloroform within the Royal Infirmary. We always take care, when it is possible, to have the stomach empty, and the administration of a small quantity of brandy, just before beginning to inhale the chloroform, has always appeared to me useful. The very rare occurrence of after sickness (I can only recall three or four within the last five years), I ascribe to the empty stomach, and never keeping the patient too deeply under the influence of the anæsthetic; while, so soon as the administration is over, the patient is covered up, gets as much fresh air as possible, and a cup of strong tea which does more to revive them, and banish sickness, than anything I know. All those who are accustomed to see chloroform given here can testify to the ease, rapidity, and safety with which it is managed, but let no one who is not fully aware of its peril, and who is not prepared to act promptly on the first evidence of danger, attempt its use, as, however safe when carefully given, it is undoubtedly in every case a certain menace against life. I am in the habit of administering chloroform in every case where an operation is to be performed, whatever may be the state of the heart or lungs, believing that if an operation must be done, there is far less danger to the patient when he is under chloroform than if he be submitted to the shock without its aid. At the beginning of the session I give

careful directions to my dressers how to employ it, and afterwards I make them in turns administer it under careful superintendence. In Glasgow, chloroform is much more used than ether. This arises, partly from habit, and also because of its more prompt action, greater portability and more agreeable nature. We, however, quite recognize the advantage which ether presents in being less depressing, and thus not so dangerous in the hands of those not accustomed to the use of chloroform.

Four large nevi were under treatment. One occupied the cheek, and the angle of the eye, and was successfully excised, as was a second which filled the greater part of the lower lip. A very large venous nevus covering the clavicle, and dipping deeply both into the neck and upper part of the chest, was cured by setons steeped in perchloride of iron; and another in the abdominal parietes was removed by injections (once) of tannic acid. It is very remarkable what extensive venous nevi may spontaneously disappear in young children after teething is passed. One child had the whole left arm from the shoulder to the fingers almost continuously covered by a cutaneous growth of this nature, forming folds of considerable size, and another had a mass extending from the right temple to the posterior limit of the parietal bone, spontaneously cured by ulceration, which required no interference except the application of simple ointment and occasional pressure, when a slight amount of hæmorrhage took place. I am fully convinced that operations are often needlessly performed to remove what a little patience would much better accomplish. I, of course, only refer to the venous variety of nevus. When the part admits of it, and an operation is required, excision is on the whole the most successful method of removal we can adopt.

Within a comparatively short time three cases of displacement of the long head of the biceps from the bicipital groove have presented themselves. In all of these cases the accident followed some violent effort, in which the arm was raised above the level of the shoulder, and the forearm sud-

denly and forcibly flexed. Two of them occurred in strong muscular men, and one in a female servant. The former suffered a good deal from pain and swelling, and it took some weeks wholly to restore the function of the limb. This accident is by no means an unusual one, but appears even now to be little known to the profession. The special motion of the arm which occasions it, the seat of pain, the function embarrassed, and the absence of any other injury, sufficiently distinguish it apart from any change to be discovered by the hand when the part is palpated.

I would, before closing, allude to one other case, which was of melancholy interest, because of the clear evidence the symptoms present gave of the exact seat of injury. A powerful man of 24, who was a notorious pugilist and well known thief, was violently thrown by his antagonist in a prize wrestling match. He fell on the crown of his head, and felt himself instantly powerless in body and limb. He did not lose consciousness, and when he was brought to the hospital, after many hours' exposure, lying on wet grass, he was suffering deeply from shock. Both lower limbs were quite paralysed; but there seemed to be partial power over certain muscles of the upper extremities. He complained of much pain in his neck, which was swelled, but free from any recognizable irregularity. He suffered much while he lived from violent pain shooting down his arms. There was normal sensation over the surface of the thorax and abdomen, and for a few days, even for some way below the groins, and he had increased sensibility in the arms to the very points of the fingers. There was also priapism. The temperature was taken three times a day, and up to his death was in all parts abnormally high. At the soles of his feet it ranged from 100·2 on the second day to 97·5, the day he died. In the axilla it was sometimes as high as 103·3. Besides this, the only unusual symptom was repeated and violent attacks of epistaxis. After death it was found that the laminae of the seventh cervical vertebra had been crushed in on the cord, which was deeply pressed

upon and softened, but not wholly destroyed, while the sixth vertebra was also partially fractured but no fragments displaced. The exact position of the injury had been recognized during life from the combination of symptoms above alluded to.

VI.—CASES ILLUSTRATIVE OF PERSISTENCE OF THE HYMEN.

By JAMES ST CLAIR GRAY, M.D., C.M., F.F.P.S.G., *Assistant to the Professor of Physiology, Glasgów University.*

THE following cases, while presenting to the obstetrician much matter of interest, are of still greater importance to the medico-legalist, as they afford incontestible proof that persistence of the hymen is compatible with the wedded state, that its destruction does not necessarily follow even the calling of a prostitute, and hence, that its persistence after attempted rape must not be relied upon solely as evidence sufficient to disprove the charge.

CASE I.—A lady, aged 43 years, who had spent twenty-four years in the matrimonial condition, suffered from a swelling in the right iliac fossa, which, on careful examination by external palpation, appeared to be connected with the ovary of that side. In order, then, to ascertain exactly its relation to this and the other pelvic viscera, a vaginal examination was attempted, but at first no vaginal orifice could be discovered, the meatus being guarded by a perfect hymen having anteriorly a small aperture which permitted the escape of the menstrual flow. Careful examination further revealed a slight depression involving the anterior portion of the perinæum and the posterior portion of the hymen. This depression, evidently the result of frequent attempts at coitus was, under pressure by the finger, capable only of affording a cul-de-sac not more than three-quarters of an inch in depth, while its normal depth was but one quarter of an inch.

CASE II.—In this case the condition of parts observed in Case I. was also observed, but was greater in degree. A lady, aged 30 years, had been married ten years, but was

childless. She complained of all the symptoms indicative of prolapsus uteri. On a vaginal examination being made, the os uteri was found situated about an inch from the meatus. The os uteri presented to the finger a very ill-defined outline; and this, on careful examination, was found to be due to the intervention of a thin membrane between that organ and the finger. This membrane was then discovered to be but a persistent hymen, which, from frequent attempts at sexual intercourse, had become pouched, so as to give rise to the formation of a perfect cul-de-sac, which, in its normal state, was from three-quarters of an inch to one inch in depth, but under pressure, either by the finger or the speculum, was capable of being distended to the extent of about one inch and a half. This cul-de-sac, as in the former case, involved the posterior two-thirds or rather more of the hymen and the anterior portion of the perinæum, and its persistence was evidently due to the presence in the tissue of strong bands of fibrous or fibro-elastic tissue, which rendered the structure as a whole very resilient.

In Case I. no steps were taken to destroy the hymen, owing to the comparatively advanced age of the patient, as also to the fact that should pregnancy have followed (which, while improbable, was yet possible), the ovarian tumour might have led to a complication of no little gravity. Bromide of potassium was given in large doses, with a view to decrease the size of the ovarian tumour, or, at least, to prevent its further development. This treatment was continued for several months, the tumour being at the expiry of that time rather smaller than formerly. When last seen, patient was still much in the same condition. Her husband was a robust man, weighing 14 stone, and was in every respect well formed.

In Case II. the patient was placed under the influence of chloroform, and the hymen was then forcibly ruptured by means of a speculum. The uterus was then found to be not only prolapsed, but also retroverted and slightly retroflexed. The uterus was replaced in its normal situation, and there secured by means of a Hodge's pessary. In a few days, all

inconvenience arising from the operation had subsided, and the symptoms due to the prolapsus had entirely disappeared.

These two cases are then, I think, sufficient to prove that, even under circumstances the most favourable for its rupture, the hymen may remain intact, and if we remember that in cases of attempted rape the circumstances are less favourable—any struggling on the part of the female having a tendency to prevent perfect penetration—we are, I think, warranted in inferring that in such cases the proportion of those in which the hymen is not destroyed must be considerable.

Still further, however, to strengthen this position, I shall now shortly relate the particulars of three cases in which the hymen was found persistent in prostitutes. These three cases were found among about 1500, who, within the last few years, have applied for admission to the Glasgow Magdalene Asylum, Lochburn, Maryhill, and should subsequent experience establish this as the precise proportion, viz., 1 in 500, it will considerably affect the significance of persistence of the hymen as an evidence or a sign of virginity.

CASE III.—A. B., aged about 25 years, and for seven years a prostitute, applied for admission to the Magdalene Asylum. With a view to ascertain whether or not she suffered from any venereal or other disease of an infectious or contagious nature, she was subjected to the usual examination. In every respect she was healthy; but the hymen was perfectly entire, save anteriorly where there was a small aperture, barely sufficient to permit the passage of a crow quill. She stated that she had never suffered any inconvenience during her menstrual periods, that she had never contracted any venereal disease, and that she was perfectly unaware of there being anything abnormal or unusual in her conformation. In this case the hymen was firm but resilient, containing evidently numerous elastic and fibro-elastic bands.

CASE IV.—C. B., aged about 24 years, also a prostitute, had adopted this path of life at the age of 16 years. Having likewise presented herself for admission to the G. M. A., was,

on examination, found perfectly free from all disease; but presented a persistent hymen of a soft, but strongly resilient consistence, indeed, so much so was this the case that on making pressure with the finger, it afforded the sensation of small reduplications of mucous membrane being gradually thrust aside, but careful examination established the case as one of persistent hymen, in which the usually thin crescentic duplicature of membrane was greatly modified by the deposit in its substance of numerous muscular bands. She, like her predecessor, had never contracted any venereal disease, suffered no inconvenience during menstruation, and was perfectly unaware of there being any unusual condition of parts.

CASE V.—Like the preceding cases, this person, D. M., aged 30, had been a prostitute for 11 years, and applied for admission to the G. M. A., wishing to alter her mode of life. She had never suffered from any venereal affection, and presented a perfectly well-defined crescentic hymen of the usual size, but of very dense consistence—indeed, to the touch it seemed almost cartilaginous.

These cases, then, shortly reported though they are, are full of significance, pointing most distinctly to the fact that the persistence of the hymen, *per se* as a sign of virginity, must be viewed with great care, while it must, at the same time, be taken as one of the class of signs rather collateral than direct in influencing the decision as to whether connection has, or has not, taken place, or at least been attempted.

As adding still further proof in favour of the occasional occurrence of this rather abnormal condition, I have but to refer to one case which has come under observation, and which adds another to those already on record in which conception has taken place without rupture of the hymen.

These cases may be divided into those occurring in unmarried and those occurring in married females. In the majority of cases included in the first class, it appears that an explanation may be found in the fact that popular opinion holds it impossible for conception to occur without full penetration; and hence a certain degree only of penetration is in these cases admitted, and thus, if the hymen be at all

resilient, it may resist the slight pressure made upon it, while by means of the small anterior aperture the fructifying element may find its way to the cavity of the uterus, and thence to the ovum. But in the case of married females, constituting the second and smaller section, no such explanation will hold, and we are hence shut up to cases of what might, for want of a better appellation, be termed *genuine persistent hymen*, due to abnormal development of tissue in its structure. It is to this latter class that the following case belongs:—

CASE VI.—Mrs A., aged 29 years, had been married seven years before this her first confinement. When first seen she had been in labour about twelve hours. Vaginal examination being attempted failed to reveal any external orifice, and this rather peculiar phenomenon at once received explanation when a persistent hymen was discovered of such size and form as completely to occlude the meatus, save in its central part, where a small aperture was discovered sufficient in size to admit an ordinary sized crow-quill. She had no idea that such was the condition of parts, and seemed to have suffered no inconvenience during menstruation. Labour was tedious, but in the course of forty-eight hours the head of the child was found to be fully distending the perinæum. A crucial incision was then made through the hymen, and delivery effected by the use of the forceps, this being necessitated by the exhausted state in which the patient now was. Recovery was rapid, and the child, though born asphyxiated, was resuscitated. Mother and child are at present alive and well.

Such are examples of persistent hymen in which the persistence is due to an adventitious development of elastic, fibro-elastic, or muscular tissue. But there is another cause which may lead to the presence in the married female of a perfect hymen. The cause to which I refer has, by Dr Marion Sims, been termed *vaginismus*, and this affection may be defined as a peculiar state of parts whereby, either from excessive nervous supply, or a peculiar irritable condition of the normal supply, any attempt to consummate the

sexual act, or, indeed, any pressure made in the vicinity, causes the infliction of intolerable pain upon the female. This is an affection certainly much more frequently met with in females in whom the hymen has been destroyed, and in whom the seat of the affection is rather the *carunculæ myrtiformes*, but the cases which I have here to record are examples of the affection conjoined with perfect development of the hymen.

CASE VII.—Mrs B., aged 38 years, had been married thirteen years. Her husband stated that whenever he attempted performance of the sexual act, she suffered excessive pain and implored him to desist. She was in every other respect healthy. When first seen, patient seemed anxious to be cured, and had no hesitation in submitting to a vaginal examination, but no sooner did the finger touch the vulva than she cried out loudly, and sprang to the opposite side of the bed. After various unsuccessful attempts, it was arranged to visit again in about eight days, when chloroform should be administered, and the necessary proceedings adopted. On calling the following week, she objected to be placed under the influence of chloroform, and said she would much rather endure the pain, as she was firmly convinced she would not recover from the effects of the anæsthetic. An attempt was accordingly made to proceed without it, but beyond ascertaining that the hymen was perfect, nothing further could be learned, and no operation performed, on account of the intense suffering which the least manipulation of the parts induced. Since then she has been frequently seen, but she is still in the same condition as previous to her *formal* marriage, an event of fully eighteen years ago. Query. According to Scotch Law, was marriage in this case consummated, and might a decree of nullity of marriage be obtained?

The two following cases are perhaps more interesting, as in both the obstacle was removed, and the operative interference was rapidly followed by conception.

CASE VIII.—Mrs N., aged about 25 years, had been married four years. She stated that since her marriage

sexual intercourse had been entirely precluded by the extreme degree of suffering induced by any attempt at its performance. General health perfect. On examination, the parts were found very tender and sensitive, the very slightest pressure occasioning intense suffering. Patient being placed under the influence of chloroform, there was found in the centre of a persistent hymen, which was tense and unyielding, an aperture about the size of a crow quill. A bougie was thrust through the hymen, then one of larger size, then a small thick-glass speculum, and ultimately one of medium diameter. After the lapse of eight days, chloroform was again administered, and the dilatation continued till the largest sized speculum was introduced. Patient complained a little of pain, but this was perfectly relieved by the use of the atropine pessary. Within a fortnight recovery was perfect; she returned to her husband in Marseilles, and has since given birth to four children.

CASE IX.—Mrs M'N. has been married seven years. In all respects has enjoyed good health, but complains that any attempt at sexual connection is accompanied by pain so excessive as at once to necessitate desistance therefrom. On examination the hymen was found entire, with a small fissure about half-an-inch long in a slightly oblique direction. Here, also, as in most of the preceding cases, there was a small aperture anteriorly, by means of which the menstrual discharge obtained egress. Chloroform was administered, and an incision made through the hack or fissure, after which specula of various diameters were introduced, thereby perfectly destroying the hymen. In a few days recovery was perfect, and she is now the mother of three children.

These, then, may be taken as typical cases of vaginismus, an affection which may be said to be of but recent introduction into the literature of obstetrics, but one which deserves the close attention of the obstetrician. To these I might have added examples of cases of the same affection, but affecting persons in whom rupture of the hymen had already occurred, but, as such cases do not illustrate the subject in hand, I reserve them for future matter of remark.

VII.—THE DIRECT TRANSFUSION OF BLOOD.*

By Dr DOMENICO BOMBA.

AT the present time the medical and public journals are much occupied by a brilliant surgical operation, performed at Naples by Dr Albini, Professor of Experimental Physiology; namely, the direct transfusion of blood from the carotid artery of a lamb into one of the brachial veins of a lady exhausted by serious hæmorrhage. This beautiful and singular operation created a sensation in public, and ignorance of the medical history of the subject engendered in no small degree the idea that a real novelty had been introduced into medicine; so that some newspapers erroneously stated that direct transfusion had not previously been attempted.

In recounting the history of the phases of the operation, it is not my intention to detract in the least from the merits of the illustrious physiologist, who has just practised it in Naples, but to give similar examples previously recorded of direct transfusion of lambs' blood into the human being, and at the same time to attract the attention of the young surgeon toward an operation, which, in the case of anæmia, presents an unexplored field which may further be fruitful in interesting physiological research.†

The first record of transfusion of blood is found in some verses of Ovid where he causes Media, who was considered to be very expert in the medical art, to suggest to the daughters of Pelia to empty their father's veins of the old, and have them infused with the new young blood.‡

Esler,§ in his Miscellany of German curiosities, quotes another passage in which Ovid appears to refer to the in-

* *La Nuova Liguria Medica*, 1873, translated and condensed by Dr William MacEwen.

† The laborious and accurate search into the discovery of transfusion of blood, by Dr Francesco Scalzi, successor to the Public Chair of Materia Medica in the University of Rome, has furnished me with materials.

‡ Metamorphosis, Book VII, v. 333-336.

§ Esler was an erudite medical professor who lived in the second half of the seventeenth century.

troduction of medicinal substances into the blood, rather than transfusion.

“ Stricto Medea recludit
Ease senis jugulum, veteremque exire cruorem
Passa, replet succis, quos postquam combibit Aeson
Aut ore acceptos aut vulnere, barba comaque
Canitie posita, nigrum rapuere colorem.
Pulsa fugit macies ; abenut pallorque situsque
Adiectoque cavae suppleantur corpore rugae.
Membraque luxuriant” *

From the period of Latin mythology we require to step to the sixteenth century in order to see the idea turn up again, still enveloped in the mythological veil, but dawning into the sphere of rational medicine. Here discrepancies arise, among medical historians, as to the name of the person who first proposed the subject, or the name of the one who first put the idea in practice. Passing by the Tuscan Marsilio Ficino † (to whom Sprengel, in the *Storia Prammatica della Medicina* attributes the first idea of transfusion) seeing that he proposed suction of the blood instead of transfusion, esteeming it fitted to prolong life, we observe that an idea of the operation appears really to be foreshadowed by Girolamo Cardano ‡ who, although fond of propagating the most extravagant novelties of his time, yet barely touches this subject, and treats it as something which deserved little confidence. It may be said that, until 1615, no work is to be found which gives decided evidence of the art of transfusion. In that year *Andrea Libavio* § relates that a contemporary

* Metamorphosis, Book VII, v. 285. The idea of recruiting the age-enfeebled by restoring the physical properties of youth instantaneously and as if by magic, delineated in this last verse of Ovid, is recalled to mind by Goethe in the episode of Faust.

† Marsilio Ficino, author of a work, “De Vita Producenda,” died in Florence in 1599, in the 66th year of his age, at the summit of fame as a medical and literary man as well as philosopher and theologian! There we read the following:—“*Cur non et nostri senes omni videlicet auxilio destituti sanguinem adolescentis sugant? volentis inquam adolescentis, sani, laeti, temperati, cur sanguis quidem sit optimus sed forte nimius. Sugant igitur more hirudinum ex brachii sinistri vena rix aperta unciam unam aut duas.*”

‡ Born in Milan, 1501, died in Rome, 1576. He says—“*Sunt qui, cum alio juvene bonorum morum duplici fistula, alii unica commutare sanguinem posse sperent: quod si fiat commutabuntur etiam mores.*”

§ *Andrea Libavio di Hallè* was a doctor of medicine of Germany who lived and practised in Frankfort.

empiric had conceived the idea without indicating distinctly how he believed it to be practicable. Hence, historians fell into error, and on account of this single and very obscure reference attributed the discovery to Libavio; in the same way others err who attribute the merit of it to *Giovanni Colle** of Padua, the author of a work entitled: *Methodus facile parandi jacunda, tuta ac nova medicamenta*, in which an indication may be found of the injection of blood into the veins, but not truly transfusion.

The genius and industry of the Tuscan *Francesco Folli da Poppi*, in the year 1652, at last made a decisive advance by which theory and vague ideas were abandoned and gave place to the experiments which Folli in that year practised in the Court of Florence in the presence of the Grand Duke Ferdinand II. † In the *Stadera Medica* Folli recalls the fact that he suggested transfusion in certain of his works of a date anterior to 1657—that is, when the English Wren instituted his experiments, to whom Sprengel, ignorant of this fact, attributes the first experiment.

That the experiments of Wren in England were published previously to those of Folli, was owing to some Englishmen who were present in the Tuscan Court and who communicated them to their countryman (Wren), who did not scruple to publish them as his own without even naming the industrious Italian, who, offended by this ungenerous action, made public protestation against it, calling the Grand Duke in testimony of his claim to precedence. But Folli first and Wren afterwards, limited themselves to experiments on animals, and did not attempt to test them on man. The last step was to perform transfusion between animals and man, and finally between man and man. With good reason the Italian doctors of this epoch assumed great superiority over foreigners, wherefore their experiments, contemporaneous to those of Denis and Emmeretz in France, Mayor in Germany, and Lower and King in England, were conducted with greater art, and therefore terminated more fortunately in the majority of cases.

* *Giovanni da Colle* published the works cited above in 1628.

† Folli was the true writer of a valuable work published in 1660 under the title of *Stadera Medica*, which was erroneously attributed to a friar—*Paolo Sarpi*.

The first experiments in Italy were instituted by William Riva, a Piedmontese, who practised surgery in Rome, with the reputation of a very able operator.* Great celebrity was given to Riva by his having performed his experiments publicly in Rome, in the presence of the most distinguished luminaries in medicine, and foreign savants.† Denis and Emmeretz also repaired thither, but chose to operate in private rather than give public ground for rivalry. On the 20th November of the same year (1667) the first experiments of the direct transfusion of blood were made in England. Here are the words of an ancient treatise on surgery, which describes the identical operation performed this year in Naples by Prof. Albini:—"On the 20th November, 1669, Drs Lower and King instituted the first trial of transfusion of blood from an animal into the human subject on a man named Arthur Coyn, in the presence of many distinguished and intelligent people. The carotid of a lamb was prepared, and a silver tube was inserted into it, from which the blood was allowed to flow freely into a vase. In about one minute nearly 12 ounces of blood flowed from the sheep, as far as they could precisely estimate the quantity. By this means they were able to obtain an approximation of the quantity which flowed in a given time, though this was subsequently vitiated by using a smaller tube. It was observed that the arterial impulse communicated itself to the vein of the arm during two minutes, and after that the operation terminated. If due allowance be made for the diminution of the calibre of the tube, it may be supposed that from nine to ten ounces of blood would be transfused. It is stated that the man derived great benefit from the operation, and that no evil consequences ensued."‡

* To whom Bartelino dedicated his epistle: *De ovarii mulierum*.

† Esler, who found himself at Rome in that time, consigned the history of these events to his Miscellany, under the title of:—*Trium sanguinis transfusionum ex animalium trium viventium arteriis in trium laborantium morbis diversis venas celebratarum anno 1667 mense decembri Romae, non bestialimore sed feliciori et humana methodo prosperoque eventu a Joanne Guillelmo Riva ec.*

‡ The following is the method of operating followed by Professor Albini:—"Suppose a gum-elastic tube, about half a meter in length, to be inserted into the carotid artery of a living lamb, and placed in communication with a vein

The transfusion of blood, from the date of its promulgation in France, Italy, Germany and England, rapidly roused fanatical supporters and furious adversaries, who made it a subject of accrimonious disputation similar to what we have recently seen about animal vaccination. Its advocates beheld in it a panacea which would maintain youth, re-establish health, alleviate mental ailments, change the hereditary disposition in certain affections, and prolong life beyond its natural limits. Its opponents on the contrary held, that these were chimerical pretensions, and that the operation was always hazardous and very frequently fatal. In this dispute the exaggerations of both sides were apparent. If in France, by Denis and his imitators transfusion of blood produced baneful results which quickly roused the public mistrust, and drew upon them the prohibitory decree which emanated on 17th April, 1668: on the other hand report asserted that the first experiments succeeded in Rome, hopes being entertained that, if perfected, it might one day be turned to some use.

If the first attempts of Riva, made upon those whose lives were disposed of, and for whom all other hopes were abandoned, did not result in an ultimate cure, they at least succeeded in prolonging life and in alleviating suffering; and were further corroborated by his cotemporaries *Manfredi* and *Ippolito Magni* in more suitable patients. The assertion that the court of Rome had issued the veto is unfounded. However, as it was in France, so also was it in Italy,—with the exception of Riva, Manfredi and other cotemporaries,—the transfusion of blood was ultimately abandoned by every

opened in the lady patient. At the extremity of a similar tube, two tubuli of glass were attached in such a manner as to remain fixed on one side to the exposed and incised artery of the lamb, and on the other to the denuded vein of the lady, into which the transfused blood flowed. Two excellent criteria guided the learned Professor in selecting a lamb, and in similarly effecting the direct transfusion of blood. Both were of a physiological nature. The first was founded on the microscopic character of the blood itself. The corpuscles being very small were consequently superlatively suited for traversing the capillaries (*piccolissime vene*) of the lady. In the other, the distinguished physiologist renounced henceforward the usual syringe, choosing rather to use the natural pump, the heart of the animal itself, which, with vigorous contractions, was at once able to impel a liberal supply of arterial blood, and, in virtue of the elasticity of the animal arteries passed a continuous stream into the arm of the patient: (*Dal Conservatore della Salute*).

one; and we must pass to the beginning of this century, in order to see it attempted again by *Michele Rosa*, who, in presence of Scarpa, renewed the neglected animal experiments.

At this recent epoch (1802), we see the commencement of the substitution of transfusion from man to man, for that from animal to man—not abandoning the method of direct transfusion—without being able to say who first originated it. In spite of the general abandonment and non-appreciation of it by physicians, we yet never wanted eminent men who placed in transfusion of blood confident hopes of certain future advantages for suffering humanity; amongst whom we have Rosa in Italy; Banner, (?) Berg, (?) and Blundell in England; Prevost, Dumas, and Nélaton in France; Dieffenbach in Germany, &c., &c. And if we speak only of Italian neighbours, it is pleasant to recall the experiments of *Polli*; the recent and successful experiments of *Landi*, performed at Pisa in the present year; and the studies of the learned zoologist, Dr *Giovanni Coppello*.

If facts overcome all argument, facts authentically established are not wanting to prove that, transfusion performed by injecting defibrinated human blood, rich in oxygen, although not free from grave difficulty and peril, is yet able in exceptional cases to arrest the inevitable issue; as for instance in anæmia from excessive hæmorrhage, which, indeed, forms the unique and logical indication for transfusion; leaving out of the question anæmia produced by long illness—viz., secondary anæmia, so that we may not err on the wrong side, and produce bad results. This is the general therapeutic idea which Dr Coppello sought to place in relief in his pamphlet entitled: *Transfusione del sangue umano come eroico rimedio dell' anemia idiopatica*.

Science must now decide whether direct transfusion from the carotid artery of the lamb or sheep into the veins of man, as has just been performed by Professor Albin, copying the primary and very ancient method, should be performed instead of the transfusion of human blood, as recently practised in France by Nélaton, in Tuscany by Landi, in England by Banner (?) and Berg. (?) Judging *a priori*, the ancient way, as restored by the

dexterous experiment of Professor Albini, appears preferable; but we are in need of exact experimental data, in order to establish *a posteriori*, a true basis and to furnish elements for the solution of such a problem. It is for experienced surgeons to institute new inquiries. Consequently young surgeons, following the practical course in our great hospitals, should accustom themselves to the operation, commencing upon the lower animals.*

Thus our paper, which was intended only to elucidate the history of transfusion, leaves to others to interest themselves in the process of the operation in the description of the various instruments *which may be the result of practical experience, and not instruments which have got to be tested*. It only remains, therefore, to complete our task by glancing at the new theory and mode of transfusion of blood proposed by Dr Alfonso Guerin in one of his papers to the Academy of Medicine in Paris.

Guerin, after abridging the history of the transfusion of blood and the various fortunes experienced in the different epochs, either by transfusion of arterial blood from the lower animals, or human blood, dwells on this latter method of transfusion by demonstrating its evil and insufficiency, because it is the defibrinated venous blood which is injected into the veins of the patient—a blood loaded with all the detritus of the body, and deprived of one of its most essential elements; namely, the fibrine, which is the primary and chief basis of muscular tissue, and from whence the blood derives its name of liquid flesh. Foreknowing the baneful results of the air introduced along with the healthy human blood, and the probable formation of sanguinolent coaguli, capable, when carried into the circulation, of producing the instantaneous death of the anæmic patient, the lung of whom already enfeebled finds itself exposed to a work of sanguinification supplemental and considerable, when you calculate the quantity (being able to receive the amount of 780 grammes) and quality of the transfused blood; and the heart itself, not having yet received the elements of more complete and suitable nutrition, ought to increase its functional activity

* To avoid the introduction of air (one of the great inconveniences of transfusion) into the veins of the patient, Dr De-Bolina has invented an apparatus which has given good results.

by the greater excitement occasioned by the new blood. The good and exceptional results hitherto obtained, according to Guerin, are dependent on quite exceptional circumstances; when, that is to say, transfusion of venous blood was performed on patients who were not completely debilitated, and who yet retained the power of organic resistance.

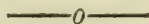
In these fortunate cases the impulse, the shock, produced by the transfusion of blood, has been able to re-animate, and by conquering the inertia of the organism imparts to it much vigour.

As for these arguments, they appear to our eyes of much smaller importance than the consideration of the transfusion of arterial animal blood; and Guerin has conceived and proposed a new method replete with material for experimental and physiological research—that is to say, the transfusion of arterial human blood itself.

This method consists in establishing a double communication between the artery of the healthy man and the vein of the anæmic patient; by this way the heart of the patient receives blood rich in corpuscles and plastic elements, and in exchange returns its own blood into the artery of the healthy man—establishing by such a method, through the medium of two hearts, a common circulation, a true doubling of two individuals, after the fashion of the Siamese twins, so as to exchange each in his turn his own blood. Such a method, be it understood, is only admissible where the patient has not any transmissible affection, and when he is only weakened through hæmorrhage. It appears at first sight to be exceedingly original and ingenious, and to be supported by physiological reason.

Guerin's experiments just made have been restricted to animals, dogs and rabbits, which were reduced to the Siamese state without any general accident. Without experience on man, that which is looked to is the confirmation of the observations and experiments by others. We think, at first sight, that the method of transfusion is conjoined with grave local lesions, which may however disappear when the experiments are repeated on a larger scale, and by establishing experimental study on animals we may at length be able to look forward to recovery in certain cases in man.

Reviews.



I.—LYON MEDICAL, organ officiel de la Société de Médecine et de la Société des Sciences Médicales. Parait toutes les deux Semaines. Lyon. 1872.

THE following is a review of some of the more interesting papers which have appeared in the *Lyon Medical* during 1872. We have supplemented those on skin-grafting from other sources, so as to make it a comprehensive and tolerably complete history.

Skin-Grafting.—The second May number commences an article by M. Marduel on Skin-grafting, which is one of the most interesting among the original papers: not that it contains anything new, but rather from the extensive collection and translation of almost all the essays which have been written on the subject.

Although M. Reverdin is generally regarded as the originator of skin-grafting, yet Hamilton of New York states that he proposed it in 1847, but, owing to the non-compliance of his patient, was prevented from carrying it out; and that he advised the use of skin-grafting in a paper in the *New York Medical Journal* in 1854. It is also known that Tigri, in the *Sommario Anatomico e Fisiologico*, Sienna, 1867, states that detached portions of the epidermis retain their vitality through imbibition of nutritive fluid. Though Tigri only referred to the *epidermide depoche pel Vesicatorio*, it would require a very little extension to come to the *lambeaux cutanés* of Reverdin. However this may be, the honour is undoubtedly due to Reverdin, if not of being the first to mention the subject, at least the first to carry it into practice, and bring it prominently before the medical public.

As is usual at the outset of any innovation, considerable diversity of opinion exists in many parts bearing on this subject.

Most observers are at one in regarding the healing sore as the most favourable field for the graft to live on, and some even consider it to be an essential. Page (*British Medical Journal*, December, 1870) states that the grafts must be planted on healthy vigorous granulations. Macleod (*Glas. Med. Journal*, May, 1871) states that the granulations must be sound and viable. Reverdin, in his paper published in the *Archives*

Générales de Médecin, 1872, points out that the wound should either be on the point of cicatrization or the cicatrization should have already commenced, and that the granulation should be healthy. He adds, however, that these conditions are not absolute, for he has planted with success a piece of tissue on a syphilitic ulcer of the lower limb in a woman aged 61 years, and success was further obtained by him in the following cases:—On a wound resulting from ablation of a cancerous mamma; on an ulcer the result of a bubo after its specific character was lost; and in one case affected with hospital gangrene. Heiberg and Hugo Scholtz (*Berl. klin. Wochenschrift*, VIII., 10, 1871) have met with considerable success in using grafts on patients who were affected with hospital gangrene. M. Gayet of Lyons succeeded in planting grafts on a surface from which a cancrroid ulcer had been removed. We find in a paper of M. Achille Dron, published in the *Lyon Medical* in December, 1872, that he performed skin-grafting on an undoubted *initial* syphilitic sore. These facts greatly enhance the value of skin-grafting as a remedial agent, and, should they stand the test of future experience, we may hope no longer to see the deformities produced by the ulcerative action of bubos induced by soft sores, which sometimes, as we have seen, cause the lower limbs to be flexed on the abdomen, by the contraction of the tissues in forming the cicatrix, and thus compel the person to walk in a stooping attitude.

The grafts proposed are various. The use of scrapings from the epidermis was advocated, and cases recorded where they were employed with success; but Mr Goldie's experiments (*Lancet* 1, 16th April, 1870) made in the Charlton Union Hospital, showed that the epidermal scrapings were of little value compared with grafts comprising the whole skin. Jacenko, Reverdin, and Macleod, have failed to produce islets of epidermis from the employment of epidermal scrapings, though the latter remarks, that "their presence on the sore has sometimes seemed in a curious manner to augment the cicatrizing activity of the edges."

Grafts, including at least the malpighian or mucous-layer, are now advocated by Reverdin, Macleod, Page, and many others; while some think they succeed best by using the whole thickness of the skin. Some prefer to take their grafts from particular parts of the body, but it matters little, provided the tissue be sufficiently vascular. M. Ollier, of Lyons, takes his from limbs amputated for accidents, and in this way secures, as a rule, healthy tissue. This proceeding is practised also by Dr Wilson, of Greenock. (*Glasgow Medi-*

cal Journal, 1871, p. 346.) Dr Hofmohl, of Vienna (*Wien. Med. Presse*, 1871), took a strip of epidermis half-an-inch square from an amputated hand, and placed it on an ulcer. "Fourteen days after, a cicatrization commenced round the margin of this piece of skin, which had adhered firmly to its new seat." Czerney, of Vienna (*Med. Centralblatt*), took a portion of epithelium adhering to a nasal polypus, two hours after it had been removed from the nose, and transplanted it on an ulcer. Its cilia were still in motion at the time of its transplantation. The epithelium grew, lost its cilia, and became converted into paved epithelium. He also found that portions of epithelium, transplanted from a uvula, excised half-an-hour previously on to a wound left by excision of the mamma, grew and helped to form the cicatrix. Jacenko (de Kiew) states that he has transplanted tissue from man to man, from man to the dog, from dog to dog, but that he failed to transplant from the dog to man. Then there comes the well-known case where Mr Bryant transplanted the skin of a negro on to a white man. Netolitzki communicates to the *Wiener medizinische Wochenschrift*, August, 1871, the fact that a M. Philippe transplanted a portion of the skin of a rabbit on to a man with success. Reverdin used a graft from a rabbit, and another from a sheep, and succeeded in both instances.

M. Dubreuil (*Gaz. des Hopitaux*, July 30, 1872) transplanted a graft from the guinea-pig on to an ulcer of the leg, and another portion from a dog on to a wound on a girl's cheek, and both succeeded. M. Letiévant (*Lyon Medical*, 1871) transplanted with success a portion of the skin from the abdomen of a dog. M. Molliere failed in his attempt to graft a portion of the tissue of a cat on an ulcer of the leg. Ollier grafted a portion of periosteum, and found that it formed an islet of epidermis. Lastly, Mr Benjamin Howard found an American officer who permitted him to remove a portion of muscle from his arm and engraft it on an ulcer from which the officer suffered, and it is stated that the cicatricial process was thereby hastened and that the ulcer healed. To this we may add, that we have planted a portion of the dermal covering of a dog on an ulcer beginning to heal, and we found that in four days after it was firmly adherent and a ring of epidermal cells formed round it. The hair and superficial layers of the dermis were shed, as was the case in all the instances where grafts from animals were used.

The size of the graft employed has been very varied. M. de Wecker (*Annales D'oculistiques*, 1872) forms a mosaic with numerous little fragments of skin on wounds of the eyelids.

Macleod thinks that the graft should be about the size of a threepenny piece; while Hofmohl used a strip of epidermis half an inch square.

The grafts do not seem to go on extending their margins indefinitely. Dobson of Bristol found that the islet never extended more than the size of a florin, and generally do not go beyond that of a sixpence. Reverdin states that they do not extend indefinitely, and that they vary from the size of a 20 centime piece to that of a 50 centime piece. He further asserts that the grafts always tend to grow toward each other, or towards the marginal cicatrix, but that it is not generally admitted that they influence the growth of the cicatrix at the margin of the wound; but, as we have already mentioned, Macleod states that the epidermal scrapings appear in a curious manner to augment the cicatrizing activity of the edges.

Considerable difference of opinion still exists regarding the histology of this subject. Page, in the *British Medical Journal*, December, 1870, thought that he had established, by microscopic investigation, that the epithelium of the skin graft comported itself in the same manner as ordinary cicatricial epithelium; and Jacenko (de Kiew) stated that he found a multiple nucleus in the interior of the cells of the malpighian layer of the skin graft. But most observers deny the theory of proliferation. M. Poncet and M. Colrat have both given papers founded on microscopic study, which appear separately in the *Lyon Medical*, and these observers arrive at conclusions nearly similar to those expressed by M. Reverdin in his essay which appeared in the *Archives Générales de Médecine* (March, May, and June, 1872.) M. Reverdin, on examining the graft 48 hours after it had been transplanted, saw that granulations were separated from the graft, and plunged down between the body of the graft and the embryonic tissue of the ulcer, with which the granulations ultimately coalesced to form a single tissue. To these prolongations he gave the name of "*bourgeons d'enchassement*," or "stilt granulations." He next describes the formation of the cicatrix round the graft. The cells, springing from the graft, have apparently only one nucleus, and he never saw any appearance of it dividing, so that there is nothing to indicate a proliferation of the elements, and in this MM. Poncet and Colrat agree with him. And M. Reverdin further states, seeing that there is nothing to indicate formation of cells from a blastema, that the only hypothesis at which he can arrive is, that the transplanted epidermis determines, by its presence, the transformation of the embryonic cells of the granulations into epidermic cells,

that is to say, that the epidermis of the graft will only form a mould or model to the embryonic cells. In practising Zoo-grafting, however varied the animals were from which he obtained the grafts, they always produced the same kind of cicatrix, namely, the ordinary cicatricial tissue found in man.

Opposed to this view, we have the theory which ascribes the principal role in the production of the cicatrix to the connective tissue; and this is advocated by M. Ollier, who cites in support of his views, the success obtained by him in producing cicatrization by means of a graft of periosteum. He might also have added the clinical observation of Howard, with his muscle grafts, as at least opposing the theory of Reverdin.

Probably, the matter would be much more easily solved did we know the mode of growth of the ordinary epithelium. We might then be able to ascertain the difference between the formation of ordinary and cicatricial epithelium; and we would also be better able to ascribe the correct theory to the production of the cicatrix from the grafts. Dr Otto Weber, long ago, stated that he had seen new cells emanate from connective tissue corpuscles of granulating surfaces. Again, many believe that the epidermic and epithelial cells are derived from the primitive embryonic cells, and that each must be derived from its parent by division of its nucleus; and several observers state that they have seen cells actually undergoing a process of subdivision. The view of Reverdin has been accepted by many; but we think that there is some other cause, some other influence or agency at work in producing the cicatrix from the islets instead of the mere presence of a "mould." It finds no homotype in the animal body. And we agree with a remark of M. Marduel, that there is still abundant room for scientific investigation, as the *facts* (?) quoted by various authors require to be further tested before any decided opinion can be pronounced.

Two cases of *Vicarious Menstruation* are to be found in the March number, 1872, reported by M. P. Meynet (*Médecin de la Charité*). The one is that of a girl aged 17 years, who had been admitted into the *Hôtel Dieu*, 1862, and who then stated that she had suffered for the last eight months from a bleeding, issuing from an aperture under the nipple of each mamma, which came on at the usual period of menstruation; and which was preceded by pain and turgescence of the mammæ. M. P. Meynet observed this vicarious flow threetimes. It occurred every three weeks. The flow lasted from two or three days, and the quantity of discharge might be reckoned

at from 30 to 40 grammes each day. The discharge was blood of a deep red colour. Tonics and iron, &c., were employed for the purpose of restoring the menstrual flow to its proper channel, but she left the hospital without any apparent benefit. However, natural menstruation set in two months after her dismissal.

Ten years subsequently she was seen by M. Meynet, who found that she had continued to menstruate by the normal channel since 1862; but her menses came on every three weeks, and were very profuse and accompanied by great pain. Her appearance and symptoms generally were indicative of chlorosis. She had been then married for three years, but had no children.

The second case was that of a woman aged 44 years, of strong constitution and sanguine temperament, who had commenced to menstruate when she was twelve years of age, and had continued to do so up till eight months previous to M. Meynet seeing her. At each period of menstruation during the last eight months her breasts were swollen and painful, and the nipples discharged reddish black blood variable in quantity, but always staining a "great number of handkerchiefs daily." She had been treated for several years for an engorgement of the neck of the uterus with ulceration. Three months prior to M. Meynet having seen her, a tumour appeared in the right breast following a slight knock. It was circumscribed, painful, augmented at each menstrual period, and was not amenable to ordinary treatment. M. Meynet remarks that certain authors ascribe bleeding from the nipple as a sign of cancer, but that this tumour showed no appearance of cancer. M. Düchanssoy mentions two cases of bleeding from the breasts without any indication of cancer.

Disease of Sleep.—M. Marduel reports a case of "Disease of Sleep," which he states is frequently observed among the negroes on the West Coast of Africa. From his description of this patient, who "sometimes slept two and three days without interruption," we would be much inclined to view the matter sceptically. "The precise state of the pupils could not be determined, because whenever the eyelids were opened the eyeballs were turned up to the back of the head." Does this happen in those who are insensible from sleep? Another case set down as the result of *coupe de foudre*, related by Fontan, appears to us to be a good instance of hysteria in the male, and as such we can commend M. Fontan for his treatment by cold baths, which was eminently successful.

M. Vernay describes a case of *convulsions in the infant*

brought on by the alcoholic indulgence of the nurse. How many deaths in this city may be the result of poisoned mother's milk?

M. Marduel gives a paper on the subject of *Extirpation of the Kidney*, from which we learn that Zambecarius first practised extirpation of the kidneys on animals. Blanchard in 1696 thought that it might be possible to practice it on man. Claude Bernard, Rayer, Prevost and Dumas extirpated the kidney several times from dogs; and when only one was removed, the animal survived. Rayer maintained that though it were possible to extirpate a healthy kidney from an animal, yet it would be folly to attempt the operation in man affected with calculus or a suppurating kidney.

Since 1869, the operation of extirpation of the kidney has been performed three times in man. The first was performed by Simon, of Heidelberg, on a woman, aged 26 years, who previously had undergone ovariectomy, and had consecutive urethro-abdominal fistula, from which the urine from the left kidney escaped. This fistula was attempted to be rectified in a variety of ways, but none of them succeeded. The kidney was extirpated. Six weeks after the operation, the patient was able to sit up in bed, and has since done well, making a complete and rapid recovery.

The second case was that of a woman 33 years of age, five months advanced in pregnancy, and having a displaced painful kidney, which prevented her from rest, and which was ultimately extirpated by Mr Gilmore (an account of which may be found in the *American Journal of Obstetrics*, May, 1871). The woman not only recovered, but carried her child till its full time.

The third case, by Burns, was that of a soldier who was wounded by a bullet in the left kidney, which established a renal fistula, followed by renal suppuration and purulent infection. As a last hope, the kidney was extirpated, but the man died soon after. These results show the practicability of extirpation of the kidney, especially in cases where the organ itself is healthy.

In the second April number there is an instrument described by M. Gayet, *Chirurgien en Chef* to the *Hôtel Dieu*, Lyons, by means of which he was enabled to reduce a dislocation of the lower jaw of more than three months' standing. It consists of (1) a straight strong bit, which is capable of being fitted behind the farthest back molar teeth, and between them and the ascending ramus of the lower jaw; (2) this bit is continuous with two stems, which are attached to

its outer extremities, and which run on the outside of the arch of the teeth of the lower jaw until they make their exit from the mouth at the distance of three centimetres from each other, then they curve downwards on to a plate of iron which is attached on one side to a handle 30 centimetres in length, and on the other side to a bent stem which stretches itself under the chin. The extremity of this last stem is furnished with a screw, which is supported on a well-stuffed pad capable of moulding itself to the lower maxilla. By this powerful lever he was able to reset the dislocation of the right condyle of the lower jaw after three months' standing. M. Gayet admits that Sir Astley Cooper and Malgagne described an instrument by Junker, on the same principle as this one, but much more complicated.

II.—ESSENTIALS OF THE PRINCIPLES AND PRACTICE OF MEDICINE. A Handbook for Students and Practitioners. By HENRY HARTSHORNE, A.M., M.D., *Professor of Hygiene in the University of Pennsylvania*, &c., &c. 12mo. pp. 487.

THIS is a work of a sort which might be easily confounded with the more trashy kind of student's manuals and vademecums—third and fourth rate productions that emerge now and then with a view solely to facilitate the labours of the “grinder,” and of which the character may usually be written in one brief sentence, “tedious to read, and useless to get by heart.” The tediousness of such books is not, indeed, in proportion to, but it is certainly in part because of, their brevity; their aim being to cram as many distinct statements of fact, or of theory, or of modes of cure into half a page as would require many pages to explain and illustrate, the result is an arid wilderness of doctrines and data, in which no gleam of personal conviction ever intervenes to show the poor overtasked student that one opinion is of more importance than another. It is otherwise with the present author, and his little book of “essentials.” Here there is no want of a guiding and determining spirit, nor is there any want of good materials; the author's decisions in matters of opinion are prompt, clearly expressed, and carry, apparently, the weight and force of conviction derived from personal experience. The book is, therefore, though necessarily a compilation, and a good compilation, very far from being a compilation *merely*; it is fairly entitled to be called, in a certain sense, an original work, and it is one of the few

books, original or other, that we feel inclined to wish had been longer than it is. Something intermediate between Hartshorne and Aitken, say, but considerably nearer to the former than the latter would, we think, be almost an ideal text-book in practice of medicine. The faults of the book are such as could not be profitably remarked upon without a much longer space than we can devote to it. The author is often very positive and assured, sometimes, we think, *too* dogmatic, and sometimes, not very often, wrong out and out. Much more often he errs by presenting statements in too compact a shape, and without the necessary qualifications and reservations. The following on a familiar theme, the typhus eruption, is only one illustration:—"Towards the end of the first week, in most cases, a rash appears of little and numerous red papulæ (miliary eruption) all over the chest, abdomen, and upper parts of the limbs. They are accompanied by *sudamina* (minute vesicles) in many instances, by *petechiæ* in a few." This is literally *all* in Dr Hartshorne's book about typhus eruption, and we appeal to any one who has seen much of the disease if this is a good description. It would not be very easy to show briefly what is wrong in it, but, as a whole, it conveys a wrong impression, and this obviously from attempting too great compression. Apropos of typhus, we may add, that Dr Hartshorne is opposed to large and indefinite stimulation in this disease, and gives full credit to the results obtained in Glasgow under an opposite system, the character of which, however, he somewhat overstates, owing to his desire for condensation. But notwithstanding this, he begins his "essentials" of treatment with the statement, that "more than half the cases of typhus, according to my observation, require alcoholic stimulation as well as concentrated nourishment, *after the fourth day*." What is the student to infer from this statement? that he is to begin stimulating more than half his cases regularly on the fifth day? If so, we beg to enter a dissent, and to say that the facts he himself refers to prove the contrary. Notwithstanding our occasional differences with the author, however, we commend his book as one to which no student and no practitioner can refer without getting many useful suggestions from it.

III.—THE PHYSIOLOGY OF MAN; Designed to Represent the Existing State of Physiological Science, as applied to the Functions of the Human Body. By AUSTIN FLINT, Jun., M.D. Vol. IV. The Nervous System. New York: D. Appleton & Company. 1872.

THIS work brings to our mind "The chest contriv'd a double debt to pay," inasmuch as it forms the fourth volume of Dr Flint's "Physiology of Man," and at the same time is meant to serve as a companion volume to Dr Hammond's "Diseases of the Nervous System."

The author has set himself the somewhat ambitious task of condensing, harmonizing, and explaining the modern views of the anatomy and physiology of the nervous system of man. If he has in any respect failed in his undertaking, it is not so much from any want of knowledge or ability on his part, as from the natural intricacy of the subject, the extreme difficulty of deciding between contending theorists or observers, and the fallacies which almost necessarily attend upon the interpretation of natural phenomena.

One advantage of no mean importance Dr Flint possesses; he has no hobby to ride, no pet theory to enunciate; or, at least, if he have one, he does not give it undue prominence. Indeed, his work evinces throughout a determination to speak that which is true, rather than that which has the charm of novelty as its chief recommendation.

The first 65 pages are taken up with the description of the general anatomy of the nervous system, which is chiefly compiled from Stricker's Manual and the last French edition of Kölliker's Manual. It is an admirable summary of all that is positively known upon the subject. Perhaps a little more space might have been given to the question of the mode of connection of nerve fibres with nerve cells. As it stands, the author has left the matter rather hazy, and a few more illustrations would have been useful, but we must not be disappointed that we are obliged to stop short of perfection. The two succeeding chapters are occupied with the discussion of the general properties of nerves, the effects of electricity, &c. In discussing the difference in function of motor and sensory nerves, the author goes a little out of his way to prove that Magendie, and not Sir Charles Bell, was the discoverer of the function of the roots of the spinal nerves.

The cranial nerves are very minutely described, both in their anatomical and physiological aspects. The anatomical connections of the nerves are adopted from Vulpian, and

appear, at least, in some instances, suspiciously minute, suggesting that the imagination has been called in to fill up the gaps left by anatomical research.

The physiology of the fifth, facial, spinal accessory and pneumogastric, is very fully worked out, that of the latter alone occupying a chapter of fifty-four pages. With the second of these (seventh nerve), the interest chiefly centres on the chorda tympani nerve, a branch which springs from the gangliform enlargement on the facial, and joins the lingual branch of the fifth. In the description of this nerve Dr Flint seems to lose much of his accustomed clearness. According to him this is a branch of the facial, which, as is well known, is a purely motor nerve. It does not appear to come from the *pars intermedia* of the facial, but even if it could be traced thither, our author denies that the intermediate nerve of Wrisberg is sensitive, so that from its origin we should decide it must be motor. Further on, however, Dr Flint states that it is the special nerve of taste of the front of the tongue (and not the gustatory, as was formerly supposed), and further describes it as the motor nerve of the submaxillary gland, and of Wharton's ganglion; so that it would appear that we have a nerve of special sense arising from the facial, a *purely motor nerve*, surely rather an improbable suggestion. The description which Owen gives of the origin of this nerve in the horse appears to have been overlooked by the author. In that animal the chorda tympani arises from a plexus formed by the vidian and the facial, with the addition of some ganglionic cells, so that it is composed of three kinds of nerve fibres—namely, sensory from the vidian, motor from the facial, and sympathetic from the ganglionic cells. Something of the same confusion is also evident in reference to the deviation of the tongue in paralysis, for, on page 162, he speaks of the lingual filament of the facial as being that which “is affected in deviation of the point of the tongue,” while, on page 182, he ascribes this deviation to the sublingual, as he calls it, that is to say, to the hypoglossal.

Many very interesting points fall to be discussed with the pneumogastrics, not the least interesting being the effect of these nerves upon digestion and the action of the small intestines. Our author cites some interesting experiments of Wood, of Philadelphia, which show conclusively that, after their section in the cervical region, the most powerful cathartics fail to produce purgation, even in doses sufficient to cause death.

Very interesting tables of the weights of brains are given,

one being of the comparative weights of the brains of white and black people, and of several degrees of intermixture of the white and black races. It seems to show that a pure black has an advantage in brain weight over those with $\frac{1}{16}$, $\frac{1}{8}$, or $\frac{1}{4}$ dilution with "white" blood, but that $\frac{1}{2}$ or $\frac{3}{4}$ white has an advantage over the pure black.

Another table shows the weight of individual brains, ranging from Cromwell, 88.99 oz. (a very doubtful case), to an idiot 34.39 oz., and including, among other notorieties, James Fisk, jun., the Erie financier, whose brain weighed 58 oz. To complete this list, we would add the brain of a Bushwoman, described by Mr Marshall, which weighed 31.5 oz., being, we believe, the smallest healthy brain on record.

The interesting subject of the location of articulate speech is discussed at some length. The following extract summarizes the author's views:—

"Taking into consideration all of the pathological facts bearing on the subject, it seems certain that, in the great majority of persons, the organ or part presiding over the faculty of articulate language, is situated at or near the third frontal convolution and the island of Reil in the left anterior lobe of the cerebrum, and mainly in the parts nourished by the middle cerebral artery."

Cautiously worded as this paragraph is, it yet somewhat overstates the case as regards our present knowledge of aphasia, and, moreover, it contains the notion that a function or faculty may be located in one part of the brain in one individual, and in a totally different part in another, which is scarcely a safe proposition. But we quote the succeeding sentences, which are perhaps intended to qualify the foregoing:—

"In some few instances, the organ seems to be located in the corresponding part of the right side. It is possible that, originally, both sides preside over speech, and the superiority of the left lobe of the brain over the right, and its more constant use by preference in right-handed persons may lead to the gradual abolition of the functions of the right side of the brain, in connection with speech, simply from disuse."

This suggestion is mainly based upon Dr Bateman's two cases of "aphasia dependent on lesion of the right side of the brain and consequent left hemiplegia, in which the persons were left-handed;" and it will be noticed by all who have read Dr Bateman's book, that Dr Flint draws from these cases very different conclusions from those deduced by the author himself. It is true that if cases of lesion of the corresponding part of the right hemisphere were the only difficult ones we had to deal with, the difficulty might thus be comfortably cleared up, but there are cases of

aphasia without any lesion at all in the anterior lobes, and these require some further elucidation.

We fail to see any great advantage in the substitution of "cephalo-rachidian" for "cerebro-spinal," and "sublingual" for "hypoglossal," although the presence of the first of these in the present volume is accounted for by Dr Flint's French education and proclivities. "Middle *temporal fossa*," on page 133, seems to us to be intended for "middle *cerebral fossa*."

But, truly, the work is throughout so excellent, that fault-finding is to us very ungrateful. It is written in capital English, is almost invariably intelligible, and, moreover, is printed with such type and such paper as we have rarely seen in transatlantic works. Altogether, it is a work which we would cordially recommend to all who are interested in the physiology or diseases of the nervous system, as we believe it to be, at the present time, by far the best on the subject in the English language.

IV.—THE MICROSCOPE, AND MICROSCOPICAL TECHNOLOGY: A Text-Book for Physicians and Students, by Dr HEINRICH FREY, Professor of Medicine in Zürich, Switzerland. *Translated from the German, and Edited by George R. Cutter, M.D., Clinical assistant to the New York Eye and Ear Infirmary.* New York: Wm. Wood & Co. 1872.

WE have been for several years familiar with this book in its original form, and have esteemed it as the best practical guide to the investigation of the animal tissues. It contains, in small compass, accurate and clear directions for the various methods by which the tissues may be examined, and is not stuffed out with idiosyncrasies and peculiar notions of the author, if he has the misfortune to possess any. While, therefore, there is hardly a paragraph which does not bear evidence in its very construction that the author has himself practised the manipulation he describes, we find everywhere the fullest information as to all the newest modes of investigation. Any one who is at all familiar with the immense activity which at present exists in the German schools, in the very department of which this book treats, will at once perceive that this is no slight praise. In both these respects Frey's book on the Microscope presents a marked contrast to two English books which we could name; for, while one of these is filled with the repeatedly used up material which the author himself has discovered and stamped as his own, the

other, by attempting to include every department of microscopic study, in great part fails in giving that direct practical information which is so necessary for one who wishes actually to work at the animal tissues.

From these remarks it may well be conceived that it was with considerable pleasure we learnt that an English translation of the work was announced. In fact, we have often expressed the opinion that the book ought to be translated. Our Transatlantic brethren have shown considerable activity of late years in translating many excellent works from the German. Some of these translations are exceedingly well done. Niemeyer's well-known work on Practice of Medicine, for instance, is as clear and readable in its American form as if it had been originally written in English. But, unfortunately, as much cannot be said of all American translations, and certainly not of the one before us. In his preface the Translator says—"An apology may be thought necessary for the style of the translation, in having followed the German so literally. The nature of the subject, however, involving as it does such very minute descriptions, and the frequent repetition of the same terms, added to the impossibility of doing justice in any other way to the author's condensed style, have necessitated a rigid adherence to the original text." We submit that the Translator, with the consciousness within him which these words express, should simply have gone over his translation again and rendered it into *English*. As it is, the process has stopped half-way, and we have a translation into *German-English*. In order to show that these words are not written in any captious spirit, we shall give one or two examples taken perfectly at random, for it is not possible to read a page without finding similar incongruities. The very first sentence of the translation, at the beginning of the introduction, runs as follows—"Within the last years the Microscope, that instrument which has conquered a new world of minuteness for natural science, has become widely known." Again, in treating of the use of chromic acid as an agent in investigating nervous tissues, the following is the rendering—"So that in this way very delicate organizations (*sic*), especially in nervous tissues, may be made visible which remained completely hidden in the examination of the fresh tissue. For this very reason it has exerted a very enduring influence in the histology of the higher nerves of sense, to which fact the works of M. Schultze especially testify." As an instance of a German construction retained in the English translation, take the following, where the repeated German word "bald" is

rendered "sometimes"—"There are two media especially which are used for this purpose; a sometimes more concentrated, sometimes more dilute solution of soda, and the diluted acetic acid."

For these reasons, the feeling of satisfaction with which we received this book has been to some extent diminished on its perusal. But in spite of all the drawbacks of a bad translation, the inherent merits of the original are such that, as a book of reference for the actual operations connected with microscopic investigation, it stands decidedly ahead of any English work with which we are familiar. It is rare indeed that any doubt can exist as to the meaning of the directions given, and perhaps to persons who intend to practically use these manipulations the directions here may suffice. In some other kinds of books defective translation is a much more serious evil, and we have been recently furnished with a very glaring example of this. The text-book of Pathology by Rindfleisch has been translated in America and also in England for the Sydenham Society. These two translations present a very marked contrast in respect to clearness and style. The writing of Rindfleisch is slightly transcendental and somewhat theoretical, and the book is not one which is easily translated; and there are many paragraphs even in the Sydenham Society translation which must present considerable difficulties to the reader, but in using the American translation the student must often stand amazed as well as puzzled before its mysterious statements. About the translation of Frey's book, however, this cannot be said. Though the English is by no means elegant, it is for the most part clear, and on the whole we can heartily recommend the work to anyone who intends to go thoroughly into microscopic investigation, and is unable to use the original.

In conclusion, we would express the satisfaction with which we see these successive manifestations of the desire of our American brethren to take advantage of the rich field which German medical literature offers for the study of scientific medicine. As many American youths go to the German schools, so we hope they carry back some of that devotion to science which characterizes so many of the best workers of those schools.

V.—LESSONS IN ELEMENTARY ANATOMY. *By* ST GEORGE MIVART, F.R.S.
Macmillan & Co. 1873.

THE Lecturer on Comparative Anatomy at St Mary's Hospital is already well-known as a critic of Mr Darwin's views, whose opinion is entitled to consideration. Mr Huxley has answered, but has not wholly disposed of the criticisms, and the more attention is paid to the subject the more it will be seen that Mr Mivart has grouped together in a formidable way the difficulties, felt by naturalists or created by Mr Darwin himself. Mr Mivart has a claim to be listened to on the Evolution question, a claim which, it is to be regretted, more writers on the question do not possess; he has carefully worked at the Anatomy of the vertebrates, and the Royal and other Societies have published several important memoirs of descriptive or theoretical anatomy. The present volume is therefore no compilation at second hand, but represents the knowledge gained, scalpel in hand, by its author. The plan of the book is admirable. The broad general statement of the plan of the human body is followed by a comparison with the plan of the body in the inferior animals, the leading facts of morphology being thus stated in a series of simple propositions. It is to be regretted that the small size of the figures, and their frequently defective printing, render the illustrations of less value than they might otherwise be; but the clearness of the diagrams compensates for this to some extent, and will, in the hands of a competent teacher, more especially if he possesses, as he ought, a little skill in drawing on the black board, render the lessons easy in spite of the necessarily complicated facts enumerated. What may be done in the way of instruction and examination is well illustrated by what took place a few years ago in Camden Town. The teacher of a school in that district had, as a speciality, the teaching of physiology, and so strong was his friends' belief in his powers, that Mr Huxley was invited to examine the school. Our informant, himself a teacher of experience, and who had already earned a high reputation in the teaching of physiology, was at a loss which to admire most, the careful instruction which enabled the pupils to apply to the horse the knowledge they had acquired concerning the human body, or the skill of the artist, whose extemporized chalk drawings were so skilful that the pupils were never in doubt as to the points to which they had to speak. Of the eleven following lessons, the back-bone, breast-bone, and ribs, the skeleton of the head, that of the upper and lower limbs, are discussed in as many chapters (ii. and v.). The sixth lesson sums up the

generalization of the comparative anatomist as to the homologies of the skeleton. The skin, the muscles, the marrow and sense organs, the circulating system, the alimentary system, the excretory organs, are the titles of the succeeding lessons. It is a misfortune that Mr Mivart's book, like Mr Huxley's physiology, has sacrificed to Mrs Grundy in a direction which the sound judgment of Mr Huxley, as the author of the earlier treatise, did not lead us to expect. The exclusion of the reproductive system from books intended for students is a grand mistake, seeing that that system bulks so largely in the broad views of classification now current. If it is the desire of men who know the evils of popular ignorance to counteract the endless mischief resulting from neglect of physiology as applied to health, it is a half-hearted enterprise to teach the people without discussing that system, which, in our civilization, affects so largely the health of the community. Lord Campbell's Act is a necessity because our teachers have been mealy-mouthed, and an artificial immorality has been created, which has done more mischief, because it has acted more secretly than what is commonly recognized as honest, straightforward vice. In the case before us, if this book is intended for students, it is incomplete to a grievous extent, the reproductive organs being very important elements in a comparative view of the vertebrates; if it is meant for a school-book, it is overloaded with technicality; the compromise is, therefore, an unfortunate one.

The views Mr Mivart adopts are in the main those of Professor Owen, but they are set forth with a directness and simplicity of language which will materially help readers of Owen's books. The examples are, it is true, not in all cases drawn from familiar objects, the writer's own labours having of course impressed unduly the peculiarities of more of the rarer animals. Indeed, there is a mixture of the elementary treatise with the technical essay on evolution, which enhance its value for students, though ordinary teachers may sometimes be perplexed. In the first chapter the vertebrates are again spoken of as agreeing in possessing a backbone—a proposition, doubtless true, but one which might, we think, be better put otherwise. For, as it stands, it directly suggests that antithesis between vertebrates and invertebrates which, apart from its logical error, a negative definition being inadmissible, leads to the still graver misconception that the vertebrates are an assemblage to which all other groups form one equivalent assemblage. This error Mr Mivart practically guards his readers against by giving the vertebrates—molluscs, articulates, and the like—as primary

divisions or sub-kingdoms ; but, he says, page 8, "the last six sub-kingdoms may very conveniently be taken together and spoken of as the invertebrata, in contrast to the highest sub-kingdom from which in so many points the other primary group agree in differing." The essential of the vertebrate is not the vertebræ, but the partition separating the neural canal from that in which the elementary and principal circulatory organs are placed, in which partition vertebræ may or may not be developed. It may be said that the statements are identical for all practical purposes ; true, but it is the duty of a definition to give only the essential, and with the *amphioxus* before us, vertebræ are not essential. Again, Mr Mivart speaks of those animals which have the nervous system ventral, namely, the annulosa, as if the relative position of ventral and dorsal were fixed, and similar for all groups. It might have been better to keep both student and teacher in mind of the differences presented by the various groups, and the difficulty of using a single term in all cases. The nervous system is placed on the surface of progression in towards the annulosa, away from it in the vertebrates ; but it is important to note that the embryonic relations of the vertebrate limbs, as of the annulosa animals, are to the skeletal structures adjacent to the nervous system. We may perhaps be charged with hypercriticism in these remarks, but we would defend ourselves by reminding Mr Mivart that the blunders of the so-called popular text-books derive a certain amount of support from the absence of correction of them by those who put forth scientific treatises entitled to authority. We would earnestly recommend science teachers to possess themselves of these Lessons in Elementary Anatomy, for no better instruction could be given than is contained in them, and no better plan could be devised for making easy the acquisition of exact anatomical knowledge.

VI.—THE DISEASES OF THE STOMACH. Being the Third Edition of the "Diagnosis and Treatment of the Varieties of Dyspepsia." Revised and Enlarged. By Wilson Fox, M.D., F.R.C.P., F.R.S., &c., &c. London : Macmillan & Co. 1872.

THIS new edition of a well-known work is one which may be resorted to with confidence for accurate information bearing on the diagnosis, pathology, and treatment of a numerous and often obscure class of cases. The present volume is rendered more complete, and consequently much more valuable for

reference, by its containing as two of its chapters the articles on Ulcer and Cancer of the Stomach which Dr Fox contributed to *Reynolds's System of Medicine*. Reinforced by these and other additions, the book is well entitled to its new name—"Diseases of the Stomach."

The information throughout is methodically arranged, and the whole subject is treated with clearness and precision; but these qualities are not obtained by any imperfect or one-sided view of the questions discussed. A noticeable feature in this book, and one which calls for our warm approval, is the abundance of the references to the works of those writers whose original researches are referred to. To this we have only to add that there is a copious index, by which the whole material is rendered easily available.

VII.—REVUE DES SCIENCES MÉDICALES EN FRANCE ET A L'ÉTRANGER.
RECUEIL TRIMESTRIEL ANALYTIQUE, CRITIQUE ET BIBLIOGRAPHIQUE, dirigé
par GEORGES HAYEM. Tome I., Nos. 1 and 2. Paris: G. Masson.
1873. 8vo., pp. 1040.

THIS volume is no doubt welcome to the medical profession in France, as there has been hitherto no publication in that country exclusively devoted to giving a list and précis of the immense mass of material yearly published in relation to medicine and the medical sciences.

The more important works receive from one to three pages of analysis of their contents, with critical remarks. Others receive a few lines, and of others there is merely a list of titles placed at the end of the portion devoted to each subject. The papers treated in the latter way are largely short notes of cases in the Medical Journals, Pamphlets, Inaugural Essays, &c. In several instances we have thought the importance of papers, as thus shown by their treatment, has not been accurately estimated, and we find that to some extent, as is natural, French works are more fully noticed than foreign ones.

Making allowance for the fact that, different hands being employed in different portions of the review, there must be some inequalities in the different portions, we think that both précis and critical remarks are fairly accurate and well done.

As a matter requiring more care, we call attention to the fact that English and German words, especially authors' names, are in a large number of instances defaced by typographical errors. This, however, is a notorious weakness of French literature.

We hope that the systematic index which is promised at the end of the year, to include the contents of four numbers, will be well arranged, as on this will largely depend the practical value of the Review.

VIII.—PRINCIPES D'ÉLECTROTHERAPIE. *Par le Dr E. CYON, Professeur de Physiologie à l'université et à l'Académie de Médecine de Saint Petersburg, &c. Paris. 1873.*

LAST year we reviewed the work of MM. Onimus and Le Gros on Medical Electricity, and we called attention to the object of these writers, which was the establishing of Electro-Therapeutics on the basis of experimental physiology. The great object of the present book, likewise, is to establish the principles of the clinical use of electricity on the ascertained laws of physics and physiology. This purpose, so excellent in conception, is beset with such immense difficulties that we might well despair of doing any good by means of electrical treatment if we had to wait till the method of its beneficial action were demonstrated by physiological proof. No better illustration can be afforded of these difficulties than the violent rejection by MM. Onimus and Le Gros of the doctrine of Anectrotonus and Catelectrotonus as completely illusory, and the hearty acceptance of this doctrine, with further physiological proofs on the human subject, by M. Cyon, as the grand foundation of Electro-Therapeutics.

Although he adduces four experiments on the human arm as confirming the laws announced by Pflüger, the author admits the immense complications which arise in prosecuting such inquiries on man, difficulties so great that he limited himself to the simplest possible cases. Under these circumstances we are driven back to experiments on animals if we wish to have a physiological basis for our treatment; but the insecurity of such observations is well suggested by the following cynical remark of M. Cyon:—"Some young medical electricians (he says) have conceived, that to become experimenters, it was sufficient to shed the blood of innocent animals, and to kill dogs and rabbits; they have published innumerable experiments, and have supposed that they have thus advanced Electro-Therapeutics to a considerable extent." (p. 10.) For ourselves, while willing to consider all carefully conducted experiments, we are chary of transferring to the living human subject all the doctrines which seem to flow from the experiments on the dissected nerves of frogs. We

think it is quite possible for great advances to be made in the therapeutics of electricity, even although many things in electro-physiology and neuro-pathology should remain obscure.

Another passage from this work may be transferred for the amusement of our readers. M. Cyon does not believe in galvanizing the brain. He does not doubt that the current passed through the skull affects the brain; but he thinks that we can have no security that it reaches the diseased part. The Corpus Striatum, Thalamus Opticus, and Pons Varolii, from their deep situation are, he thinks, but little affected by the current, although these are usually the parts involved by disease, while the cortical portions of the brain receive the chief share of the action, although they are usually the least affected. He says:—"A patient presents himself to a medical electrician with the symptoms of a confused nervous affection. The doctor at once diagnoses a cerebral disorder, which, of course, is all the more dangerous in that the affection in itself seems trifling. It is always an irritation, a softening, or a tumour of the anterior or posterior, or the right or left part of the cerebrum or cerebellum, at a distance of so many millimetres from the Pons Varolii. With respect to the precision of the diagnosis there remains absolutely nothing to be desired. The patient is treated with weak currents passed through the head; but recourse to other methods of treatment is not despised. If by chance, or by means of the secondary treatment, the patient improves, the electrician concludes:—1st. That his diagnosis is confirmed, and that a tumour existed at the part of the brain indicated. 2nd. That the sovereign remedy for such a tumour is the constant current from 10 elements passed through the brain. . . . It is fortunate also if such writers are modest enough not to come to a conclusion from such observations as to the physiological function of the part of the brain which they supposed to be diseased." (pp. 194-195.)

We are afraid that those of our readers who have had occasion to refer to the works of continental writers on medical electricity, must frequently have been amazed at the certainty with which a diagnosis is announced. A similar confidence was shown in the work of a well-known American authority on electricity and nervous disease, recently reviewed in these pages. We hope, that with the diffusion of constant current batteries in this country, a similar over-weening confidence in diagnosis may not show itself amongst ourselves.

Curiously enough, although M. Cyon objects to galvaniz-

ing the brain, he advocates galvanization of the sympathetic. He points out, however, that very absurd ideas have been entertained as to the benefits to be derived from acting merely on the cervical portion of the sympathetic; and he likewise believes that many of the effects actually produced are due to stimulation of other nerves. There remains, however, a certain class of cases to which he thinks it applicable. In this connection we may mention that he pours ridicule on the idea of stimulating the retina by a reflex action on the 5th nerve.

This essay may be read with advantage by those who are trying to understand the relationship of the physics and physiology of the subject to Electro-Therapeutics; but it is not a work adapted for communicating much practical insight into the treatment of disease. It may, however, pave the way for some further work of more immediate utility to the physician, as the writer of the essay seems well acquainted with his subject, not only in its scientific, but also in its practical aspects.

IX. 1.—**SYPHILIS: ITS NATURE AND TREATMENT, WITH A CHAPTER ON GONORRHOEA.** By CHARLES ROBERT DRYSDALE, M.D., *Physician to the Metropolitan Free Hospital and the North London Consumptive Hospital.* London: Baillière, Tindall & Cox.

2.—**CONSTITUTIONAL SYPHILIS: BEING A PRACTICAL ILLUSTRATION OF THE DISEASE IN ITS SECONDARY AND TERTIARY PHASES.** By JAMES GEORGE BEANEY, F.R.C.S., Melbourne. F. F. Baillière. 1872.

1.—THIS small volume commences with a chapter on gonorrhœa, containing mainly a résumé of the opinions expressed in current writings on the subject. It adds nothing new, but deals chiefly with the author's opinion regarding the views under professional consideration at present. He defines gonorrhœa as "a *special* inflammation of the mucous membrane of the urethra or vagina, and differing somewhat from urethritis, which is a *simple* inflammation of the same membrane." Had he proceeded after this definition to point out wherein this specialty consisted, he would have added something original. But much as has been written on the subject, the question still remains, What is it that constitutes the difference between *special* and *simple* inflammation of the urethra? Or, as it should be put, Is there any difference between gonorrhœa and urethritis?

Simple urethritis produces a muco-purulent secretion, and neither chemistry nor the microscope can discriminate any

divergence in the character of this discharge from that which is set down as gonorrhœal. The endoscope shows that discharges from the urethra arise from an inflammatory condition of the mucous membrane of greater or less degree, but points out no variety in the kind of inflammatory action. (We here exclude all lesions arising from chancres and chancroids.) So that, as far as the lesion is concerned, a difference cannot be established. The etiology shows no less conclusively that there is no specific discharge which alone produces gonorrhœa; on the contrary, it demonstrates that a gonorrhœal discharge may be brought about by mechanical as well as chemical irritation.

The passing of bougies in the male, and the forcible penetration or bruising of the female pudenda, such as sometimes occurs in cases of rape, are well known as causes of muco-purulent discharge. MM. Ratier, Swediaur, and Cullerier all state that a purulent discharge may be produced by injecting liq. ammon. dil. into the urethra. Then we have Hunter mentioning a case where the urethra sympathized with dentition and produced all the symptoms of gonorrhœa. Fournier, whose experience of venereal disease and his method of investigation are such as to warrant the very greatest weight being placed upon his views, is inclined to believe that gonorrhœa is oftener produced from venereal and alcoholic excesses than from contact with gonorrhœal matter. And both Fournier and his teacher have shown that gonorrhœa may be produced by the secretions from a perfectly healthy female (though some ascribe this to an over acidity of the vaginal mucus), also from uterine catarrh, leucorrhœa, and the menstrual flow. All these produce gonorrhœa as a muco-purulent discharge. So that gonorrhœa and urethritis are but two terms for one disease.

The idea of a special inflammation producing a specific discharge, named gonorrhœa, is but a remnant of past inaccuracies, inaccuracies which looked upon venereal disease as of one kind only; and as long as venereal diseases were regarded as having a common source, it was correct to attribute a specific origin to certain urethral discharges. More recent investigations have shown that discharges from the urethral mucous membrane may result, in the first place, from a specific poison, or poisons, generating chancres and chancroids; and in the second, from an inflammatory state of the canal. We have here only to deal with the latter—the inflammatory state of the mucous membrane—induced, as inflammation in other parts of the body is, by irritation. The principal cause of irritation is undoubtedly venereal excesses, combined, as they most frequently are, with over indulgence in alcohol; and probably a parallel position in

the etiology may be assigned to the action, on the mucous membrane of the genitals of one person, of certain irritating discharges emanating from the generative organs of another, prominent among which are muco-purulent secretions.

Pus, in a septic condition, is a powerful irritant, as is manifested in its militating against the healing of wounds and its retardation of the process of cicatrization. It is well known to all who have had to dress wounds bathed in septic pus, that their hands smart for some time after having been in contact with it, and crops of pustules may even be produced on them by its irritating influence. How much more should it affect the mucous membrane of the urethra in a state of engorgement? A violent gonorrhœa was produced by the introduction into the urethra of some of the inflammatory products from an eye affected with Egyptian ophthalmia. Gonorrhœa contracted in warm climates is generally much more virulent than that which is produced in colder climates, and this is generally attributed in some vague way to the baneful effect of the contact of the different races: may it not rather be dependent on the fact that putrefaction takes place much more rapidly in warm than in cold climates, and that therefore the secretions under the influence of the former are much more irritating.

In short, by regarding all urethral discharges, other than those which sometimes emanate from soft and hard sores situated in the urethra, as urethritis, the anomalies which cling to the view of a specific origin of these discharges disappear, the name is no longer misleading, and it forms the basis of rational treatment. This is the only position which present investigation renders tenable, and it lies with any who assume a specific origin for these discharges to adduce evidence in support of their views.

As to treatment, Mr Drysdale is not a strong advocate of specific remedies, but rather trusts to local applications and attention to general health.

Under the complications of gonorrhœa, it is stated that in some rare cases puncture of the bladder *per rectum* requires to be resorted to, for the relief of retention of urine. We think that these cases are rare indeed where such an operation has to be practised. Out of a large number of cases of retention of urine treated in the Royal Infirmary, there were few which were not relieved for the time by being placed in a warm bath and having a quarter of a grain of morphia injected into the subcutaneous cellular tissue of the perinæum. Cazenave of Bordeaux advocates the introduction of a piece of ice the size of a chestnut into the rectum for the same purpose, and he states

that during twenty years' experience he never failed in giving relief by this method.

Gonorrhœal ovaritis is mentioned as one of the most frequent causes of sterility among prostitutes. The author says that "Dr Wilks, of Guy's Hospital, London, in a private note to the author, has expressed an opinion as to gonorrhœa being the chief cause of the notorious infertility of prostitutes; and not, as surmised by Acton and others, the excesses to which they abandon themselves." The divergence in opinion between Wilks and Acton would disappear by taking the view of these discharges mentioned above; that the inflammation of the mucous membrane of the urethra was most frequently produced by venereal excesses.

Attention is drawn to vaginitis in young children as being an important point in state medicine. Few have any idea of the number of criminal charges of assault on young female children, which are preferred to the police, against innocent people, by mothers or guardians, as the only explicable way, to their minds, of accounting for vaginal discharges. No doubt, in some instances, the presence of these discharges in young children is taken advantage of by females of a degraded moral standard, as a plea for advancing accusations of a criminal nature against some one out of bad feeling, or as a cloak for mercenary purposes. But in the greater majority of cases the plaintiffs are perfectly sincere, though their minds have become so excited as to cause them to misinterpret the simplest and most customary acts, and to construe them into evidence of criminal intent. The child in many instances is so frightened that it is fain to acquiesce in any story, and to "confess" a something that it has heard for the first time from its mother. The greater proportion of these cases are entirely without foundation, and their stories, when sifted, come to nothing; but sometimes it is difficult to convince the mother that the discharge has arisen from constitutional causes. It is also a mistake to imagine that these discharges only originate among delicate children, for we have seen them in the strong and vigorous, and the only cause ascribable was the filthy state in which they had been kept.

The author gives a digest of the principal views at present promulgated on the origin, nature, and treatment of syphilis. There is still some lingering idea in the minds of a few that what is defined as gonorrhœa is in some way connected with syphilis. This arises, as we have said, from the want of distinct definition. The existence of chancres in the urethra as pointed out by Ricord, explains how it may happen that syphilitic

secondary and tertiary symptoms may follow after a urethral discharge, without any external sore. We agree with the author that this may throw light on such cases as:—"A man recently in the Metropolitan Free Hospital, suffering from multiple exostosis of the tibiæ and bones of the forearm, had no recollection of any kind of lesion intervening since the time when, about thirty years before, he had suffered from gonorrhœa, and there were no sores."

In talking of secondary syphilis, the author, while speaking of Roseola, says, "It is distinguished from measles *by the want of fever*, but is not always so easily distinguished from the mottling of the skin produced by cold." Now, we generally see Roseola ushered in by a smart paroxysm of fever, and unless the history be known it is often difficult to diagnose from measles, &c. After a few days have passed, it then bears the characters spoken of above.

One of the most marked changes in the recent history of syphilis, is that of attributing a syphilitic origin to many diseases, such as struma, and more recently to some forms of bronchitis, phthisis, &c., &c. There are few of these diseases which can be clearly traced to a syphilitic origin. While in no way denying that syphilis produces a degenerating action on the tissues, thus encouraging any constitutional disease which may have been otherwise inactive and might possibly never have shown itself, we still think that evidence is wanting to prove that phthisis, for example, can be classed as a concomitant of syphilis. Too much dependence is placed upon the presence of rolling glands in the groin, and the yielding of the disease to Iodide of Potassium. Many have rolling glands in the groin and elsewhere who have never had syphilis. And as to "yielding to Iodide of Potassium," many diseases may be aided in their dissolution by its absorbing qualities as well as syphilis, and many may disappear during the time that the patient is using the drug without the drug having any influence on the disease, and yet this argument would have us call such cases syphilitic!

A long chapter is devoted to treatment, which may be summed up, as far as the author's views are concerned: Give Iodide of Potassium in all stages of syphilis, and take care that you don't use Mercury. In speaking of Iodine, the author makes no mention of the effect of doubling the dose of Iodide of Potassium. We have often found, that when Iodism appeared while three grains were being used three times daily, it rapidly disappeared if the dose were increased from 3 to 6 or 12 grains.

On the whole, Dr Drysdale's book is clearly written, and gives a fair exposition of the views at present entertained regarding syphilis and its concomitants.

2. Mr Beaney's volume is chiefly interesting on account of the number of cases, illustrative of the various constitutional affections, which are derived from the author's practice, as well as from the recorded experience of others. It is freely supplemented with copious extracts from the works of cotemporary writers. The keynote of his writing seems to be : that syphilis pervades all classes of society, and is the probable cause, directly or indirectly, of the greater number of ailments which manifest themselves in man, though often appearing under the guise of other names, and treated as other affections : that it is the duty of surgeons to be always on their guard, and that even in cases which are not suspected to be syphilitic, and which prove obstinate to ordinary treatment, an anti-syphilitic course may prove of the greatest value.

But throughout the book there is a tone which produces uneasy sensations. Here are a few extracts illustrative of what we mean :—"I have by no means exhausted the numerous forms in which syphilides appear. Enough has, however, been said to apprise the reader of the very grave character of such disorders, and to lead him to dread their inroad, as well as to admonish him of the extreme folly of trusting to anything like doubtful or extraneous aid. The frightful disfigurements of the face, and the torments of the several eruptions as they appear in every part of the body, cause the miserable victims generally to hide themselves from the public gaze, either by retreat to the public hospitals or to their chambers, whence they seldom emerge save at night, when the evidence of the horrible affections cannot be seen." (p. 28.)

Again, speaking of lichen : "The infected person should have recourse in this case also to his medical adviser, *or to some member of the profession competent to render him efficient relief.*" (p. 30). We italicize this latter portion. Talking of the tubercular syphilides : "When this stage is reached the constitution is a prey to a devouring influence that will, save under the highest scientific treatment and the greatest care, eventuate in miseries that must render life a burden, and cause the unhappy wretch to hail the approach of the hour that shall throw its dreary pall over all earth's miseries." (p. 59). Then at p. 128 : "There can be no more appalling spectacle in the array of diseases to which we are subject, than the invasion of syphilis upon the organs of special sense—as, for instance, to observe its bursting in upon the organ of vision, shutting out

the light of heaven, and plunging the miserable victim into the drear and fatal gulf of irretrievable darkness." At page 12, speaking of Roscola: "One of the hints that may judiciously be thrown out for the better guidance of the infected in this matter is . . ." Page 80: "It is competent for any one to search for the historical data necessary as elements of investigation in these serious cases: hence I deem it right to point to those who may discover mental derangement approaching in their friends or acquaintances to judiciously seek for evidence—if it can be obtained—that shall determine whether the syphilitic taint may be present as a cause, or complicating element."

The author seems to address the profession, but speaks also in language which the public will understand; indeed, though the profession are addressed, it seems as if it were with a degree of scruple. The public will no doubt thank him for his earnest endeavours for their well-being.

X.--AIR AND RAIN, the Beginnings of a Chemical Climatology. By ROBERT ANGUS SMITH, Ph.D., F.R.S., *Inspector of Alkali Works for the Government*. London: Longmans. 1872.

WE have become familiar with the chemical analysis of water, in questions of public health, with the important differences thereby discovered in its composition, and especially with the detection of impurities. Dr Smith's book is an endeavour to deal similarly with air. The analysis of rain is introduced for the information it gives of the impurities in the air through which it falls. In the case of water, chemistry has given some meaning to the popular belief of the middle ages that their frequent plagues originated in poisoned wells; and now Dr Smith weighs and measures that "something in the air," which has hitherto been a vague though proverbial agent in the causation of disease. "Chemistry has not hitherto done enough in sanitary inquiries, and it ought to be able to relieve medical men of much of their heavy responsibility." We find here, "expressed in chemical and exact language, the meaning of a crowded town or room, or an imperfect atmosphere, and an open place." This book is, therefore, so far a *Novum Organon* of sanitary science, "relieving the subject from the narrowness of merely individual opinion."

The healthiness of a community, or the unhealthiness, is the ultimate issue of a variety of causes acting at every moment of time on a multitude of individuals. The effect at any one moment, or even in any one individual, may

be imperceptible, but the continuity of the effect in the individual, and their aggregation in the community, produces the collective result. Hence it is, that proceeding by analysis in the investigation of questions of public health, time and number condition our inquiries. The more we endeavour to descend to the particular, to determine local causes of disease, and to trace to the street or tenement the unhealthiness which belongs to the city as a whole, we become aware of an increasing vagueness and insubstantiality. We hope for something tangible, and we are disappointed. We find health where on general principles there should be unhealth, or rather we cannot demonstrate the unhealthy particular. Our methods lack precision. On the other hand, proceeding by synthesis, we at the very outset feel that we are dealing with the vague. The argument on which every procedure for the removal of nuisance is based, is synthetic. Its essence is the exercise of an unhealthy influence while it exists, at the very time of inspection—a midden in a back court, an unventilated lobby, an unpaved yard, an unwashed close. Persons not accustomed to think of, or to employ material forces which cannot be seen, or smelt, much less handled, find it difficult to have faith in the deleterious influence of something which is imperceptible to the senses. You cannot smell the midden a few yards off, nor perhaps distinguish at the ordinary level of the nose any difference between the air above an unpaved and a paved yard. In such circumstances a factor or proprietor cannot be expected to regard the sanitary officer as anything but a visionary, a pure theorist. Dr Smith brings the chemist to the rescue just at that period in the analytic method, when our conclusions begin to fade, and at the outset of our synthetic method when we want a foundation of appreciable facts. In endeavouring to discover a cause for an effect present in variable proportions, every addition to the category of differences brings us nearer the object of inquiry. It is, therefore, a direct and positive contribution to sanitary science to be able to show that there is a vast difference in the composition of the air of town and country, of different towns, of different parts of a town, and of different parts of a house, and that these differences are not capricious, but consistent and stable. On the other hand, the synthetic basis afforded to sanitary operations by the observations of an exact science, such as chemistry, cannot but impart more consistency of method, and more determination, arising from positive conviction and lucid data, to those officers whose duty it is to carry out such

operations. Sanitary science will rise greatly in public estimation, and its demands will be treated with greater respect when air-washings are adduced in evidence against middens, unventilated lobbies, offensive trades, and other forms of nuisance.

Dr Smith calls his book "The Beginnings of a Chemical Climatology," and rightly so. He has indeed done little more than prove that chemical climatology is possible. To ascertain and establish laws, or even fairly to make out limited local features, will demand a multitude of observations by many observers. The subject somewhat resembles terrestrial magnetism. Averages must be derived from hundreds if not from thousands of distinct experiments. Indeed, while we are sure Dr Smith himself correctly estimates the value of his averages, we wish he had given in each case the number of observations on which they are based. In the comparative tables of the results of analysis of rain, it is, for example, misleading to range "London, 1869," "Manchester, 1870," and "Glasgow" so as to be "compared," when the London figures are an average of 4 to 5 observations, the Manchester of 31 to 34, and the Glasgow of 7, and those with rain collected without uniformity as to season of the year or duration of the collection. "The specimens from Glasgow were collected by an exposure of the bottles for several months," we are told, and also that the "season was dry." Yet on the analysis of these specimens, Glasgow is ranked in the comparative tables, and while the author at p. 262 seems quite alive to the possible fallacy, at p. 274 he appends to the comparative table of sulphates this remark:—"Glasgow gives a remarkably high number. The great mortality seems to be explained by the tables as a whole. The table above would not be sufficient, but is an important one nevertheless." We know so much otherwise of Glasgow, its houses, its atmosphere, and the nature of its mortality, that we shall not quarrel even over this sweeping suggestion; but having regard to the notoriety of Glasgow mortality, and the very limited observations by which its position in these tables has been determined, the constant introduction of "Glasgow" to point the moral reminds us of the proverb concerning the fate of a dog which has a bad name. We suspect that, if our city had not been known to be unhealthy, Dr Smith would have followed what he tells us was his first impulse—"to leave them out and have fresh samples taken," as indeed was done with a set of London specimens which were "too long exposed to dry weather to compare with the others, and an excess of matter is obtained in them."

(p. 262.) This much must be added in fairness, that while those tables of averages are given, every individual observation from which they are derived is somewhere to be found, recorded with every possible detail, in this volume.

Nearly the whole of "Air and Rain" has been published before in Dr Smith's "Reports under the Alkali Act," and in connection with the Royal Mines Commission. Another portion "was done many years ago, when occasionally making inquiries for the Board of Health." There is no attempt at consolidating or organizing this work so distributed over different periods. The fragments are reprinted almost as originally published. The consequence is that we have a book containing the fruit of immense labour, bearing on questions of the greatest and most pressing importance, full of remarks suggestive of lines of thought, but without method, without a single literary grace—indeed, in both respects, with very much the opposite qualities. Dr Smith's sentences are wheezy and asthmatic. His defects of expression seem to react upon his ideas, so that they dance before him, and require many attempts to entangle them in words. Add to all this the repetition which is recognized in reading right through a series of papers all related to the same subject, but published separately and sometimes independently, and it will be understood how much enthusiasm is required to carry one through the task. Still, everything is here, both in the way of history of chemical climatology, and of translations and abstracts of the work of others, with Physiological Experiments on Foul Air, observations on the Air of Mines, disquisitions on Ventilation (involving some important remarks about the great sewer and water-closet question), on Crowding, Coal-Smoke, Effects of Acid Fumes on Vegetation, &c., &c.

Probably we cannot better show the importance of Dr Smith's book than by giving some of his results with reference to the air of towns. From various observations, air which contains, per hundred volumes,

| | | | | |
|----------------|-----|-----|-----|-------|
| Oxygen, | ... | ... | ... | 20.96 |
| Nitrogen, | ... | ... | ... | 79.00 |
| Carbonic Acid, | ... | ... | ... | 0.04 |

is regarded as a favourable specimen. From analysis of **Glasgow air** in winter, at 15 close and 15 open parts, two specimens being taken at each, Dr Smith found the following:—

| | | | | |
|--------------|-----|----------------|-----|---------|
| Close parts, | ... | Oxygen, | ... | 20.8890 |
| Open " | ... | " | ... | 20.9293 |
| Close parts, | ... | Carbonic Acid, | ... | .0539 |
| Open " | ... | " | ... | .0461 |

This gives an average in Glasgow air of 20·9092 oxygen, and ·0502 carbonic acid. For comparison, we may say that the average of *oxygen* in London air ranges from 20·857 in the Eastern district to 20·95 in the Parks and open places; of Manchester air, 20·947; of the worst parts of Perth, 20·935: of air over a Manchester midden, 20·70. In Glasgow, the highest percentage of oxygen was 20·995 at Pointhouse Pier, the lowest 20·865 in a High Street Close. Of *carbonic acid*, the average of all Manchester specimens of air was ·0442; of all London in 1864, ·0341, in 1869, ·04115; of Perth, ·04136. In Glasgow, the highest percentage of carbonic acid was ·0704 in a Close in Well Street, the lowest ·0337 at Park Terrace, West. These results are evidently consistent and sufficient to show that the variations are not capricious, but in accordance with law.

In connection with the Royal Mines Commission, Dr Smith made in a close lead chamber careful and elaborate observations on man, to determine the physiological effects of such variations in the composition of the air. The narrative of those experiments is full of spasmodic sentences, in which Dr Smith delights, containing "half-revealed and half-concealed" ideas of the most valuable and suggestive nature. He observes that "the senses are quite unable to measure degrees of closeness, and raise as much alarm at a state which may be represented by 0·1 per cent. of carbonic acid, as they sometimes do when there is nearly 4 per cent. with a diminishing pulse, and a quickening respiration, or incipient gasping for breath." Subsequently, he proves that it is the organic impurity usually found along with de-oxygenation, which offends the sense and creates timely discomfort. He observed that depressing effect, headaches and languor, which a few hours' house-to-house visitation among the poor of Glasgow always produces—"that which may be borne for many hours, yet depresses deeply, and changes are taking place in the body and mind, which many hours afterwards of pure air are required to obliterate." The diminution in force and frequency of the pulse, and quickening of respiration alluded to above, were the physiological effects of de-oxygenated air, the substituted carbonic acid being the principal lethal agent. "Whatever the explanation may be, my conclusion from the experiments is, that *the smallest diminution of oxygen in the air breathed affects animal life, if its place is supplied with carbonic acid.*

The composition of rain is interesting in itself, because the matter dissolved and suspended in it is by it conveyed to the soil, and has agricultural value. In this aspect the subject

was treated by Pierre in the *Chimie Agricole*, 1860. But rain has also an interest as conveying information on a larger scale than can otherwise be obtained of the substances, gaseous and solid, dissolved or floating in the region of air through which it falls. The principal of these substances are chlorides, sulphates, ammonia, nitric acid, and albuminoid ammonia, with particles of dust, soot, &c. At p. 249 minute directions are given as to the precautions requisite in collecting specimens of rain-water.

Chlorides are, of course, uniform constituents of maritime air, chiefly common salt; but they are also a product of combustion of coal, and of such processes of manufacture as are conducted in alkali works, glass works, and potteries. As a general rule, sea-rain is alkaline, and rain deriving its chlorides from other sources is acid. "An excess of chlorides taken alone is no proof of a bad atmosphere, but the excess in an inland place above the amount in the district surrounding it, is a certain proof of impurities being thrown into the atmosphere." Taking Valentia (Ireland) as 100, we give the comparative proportion of chlorides in rain collected at the following places, and, as illustrating their origin, the actual acidity of the rain calculated as sulphuric anhydride in grains per gallon is added within brackets:—

| | | | | |
|-------------------------------------|-----|-----|-----|-----------------------|
| London (1869), | ... | ... | ... | 2.6 (.2713.) |
| Birkenhead, | ... | ... | ... | 6.5 |
| Scotland (Inland Country Places), | ... | ... | ... | 6.9 (.0220.) |
| England (Inland Country Places), | ... | ... | ... | 8.2 (None.) |
| Manchester, | ... | ... | ... | 12. (.7124.) |
| Scotland (Towns, Glasgow excluded), | ... | ... | ... | 12. (.2217.) |
| Newcastle-on-Tyne, | ... | ... | ... | 16.7 |
| England (Towns), | ... | ... | ... | 17.9 (.5972.) |
| Glasgow, ... | ... | ... | ... | 18.4 (1.0589.) |
| St Helens, | ... | ... | ... | 19.6 (.2785.) |
| Liverpool, ... | ... | ... | ... | 20.9 (.8096.) |
| Valentia, ... | ... | ... | ... | 100. (None.) |

Glasgow stands very high in chlorides and very much the highest in acidity, so that the source of her chlorides is undoubtedly her coal combustion. Liverpool is higher than Glasgow in chlorides, but much lower in acidity, and gets part of them from the sea, though not much, as we may infer from Birkenhead being so low in chlorides. Valentia rain is not acid; the chlorides there are marine.

Sulphates are also a product of combustion of coal, but their most general source is the oxidation of the products of animal and vegetable decomposition. "In other words," says Dr S., "just as I believe chlorides with proper deductions to

be a measure of the sewage, however old, in water, so I believe sulphates to be a measure of the sewage in air, unless when coal interferes too much to permit allowance to be made." Again taking Valentia as 100, the comparative proportion of sulphates in the rain of the following places was—

| | | |
|---------------------------------------|-----|--------|
| Scotland (Inland Country Places), ... | ... | 75·5 |
| Valentia, ... | ... | 100 |
| England (Inland Country Places), ... | ... | 202·2 |
| Scotland (Towns, Glasgow excluded) | ... | 604·4 |
| London (1869), ... | ... | 750·5 |
| Birkenhead, ... | ... | 848·2 |
| St Helens, ... | ... | 1215·3 |
| England (Towns), ... | ... | 1255·3 |
| Liverpool, ... | ... | 1450·2 |
| Newcastle-on-Tyne, ... | ... | 1627·7 |
| Manchester, ... | ... | 1641·9 |
| Glasgow, ... | ... | 2571 |

It is the position of Glasgow in this table, as compared with other large cities, which leads Dr Smith to remark that "Its high mortality seems to be explained by the tables as a whole."

Ammonia is also a product of organic decomposition, and exists as the sulphate, chloride or carbonate—"their presence indicates objectionable or decaying matter, and that matter may send out into the air worse substances." The comparative position of the following places in respect of ammonia salts, taking Valentia as 1, was—

| | | |
|---|-----|-------|
| Valentia, ... | ... | 1 |
| Scotland (Inland Country Places), ... | ... | 2·96 |
| England (Inland Country Places), ... | ... | 5·94 |
| London (1869), ... | ... | 19·17 |
| Scotland (Towns, Glasgow excluded), ... | ... | 21·22 |
| St Helens, ... | ... | 25·33 |
| England (Towns), ... | ... | 28·67 |
| Liverpool, ... | ... | 29·89 |
| Manchester, ... | ... | 35·94 |
| Glasgow, ... | ... | 50·55 |

Albuminoid Ammonia is estimated from the nitrogen of the animal and vegetable matter existing undecomposed in the rain. It is "a measure of sewage of air not purified, and includes the most dangerous substances, germs of living things, vegetable and animal." The comparative proportion of albuminoid ammonia, obtained in the rain of the following places, taking Valentia as 1 or 100, was—

| | | |
|---------------------------------------|-----|------|
| Valentia, ... | ... | 1 |
| Scotland (Inland Country Places), ... | ... | 1·15 |
| England (Inland Country Places), ... | ... | 3·21 |
| Liverpool, ... | ... | 4·67 |
| London (1869), ... | ... | 6·03 |

| | | |
|-------------------------------------|-----|------|
| Scotland (Towns, Glasgow excluded), | ... | 6.23 |
| England (Towns), | ... | 6.29 |
| St Helens, | ... | 6.76 |
| Manchester, | ... | 7.38 |
| Glasgow, | ... | 8.82 |

Nitric Acid is another product of decomposition of organized matter. "The amount is a measure not only of the impure matter, but of the progress made in purifying or cleaning it." Valentia being 1, the comparative position of the rains of the following places was—

| | | | | | |
|--------------------------------------|-----|-----|-----|-----|-------|
| Scotland (Inland Country Places), | ... | ... | ... | ... | 0.83 |
| Valentia, | ... | ... | ... | ... | 1. |
| Liverpool, | ... | ... | ... | ... | 1.57 |
| England (Inland Country Places), | ... | ... | ... | ... | 2.02 |
| London (1869), | ... | ... | ... | ... | 2.27 |
| England (Towns), | ... | ... | ... | ... | 2.33 |
| Manchester, | ... | ... | ... | ... | 2.79 |
| Scotland (Towns, excluding Glasgow), | ... | ... | ... | ... | 3.14 |
| St Helens, | ... | ... | ... | ... | 3.82 |
| Glasgow, | ... | ... | ... | ... | 6.72. |

Total Organic Matter, as indicated by the amount of oxygen required to oxydize it by the permanganate test. Taking Scotland (sea-coast country places, west) as 1 we get the following series of comparative amounts of oxygen per million parts of rain, the amount of organic matter being proportionate :

| | | | | |
|-------------------------------------|-----|-----|-----|-----------------|
| Valentia, | ... | ... | ... | 2.72 |
| Scotland (Inland Country Places), | ... | ... | ... | 14.67 (1.) |
| England (Inland Country Places), | ... | ... | ... | 25.89 |
| Scotland (Towns, Glasgow excluded), | ... | ... | ... | 104.39 (6.39.) |
| St Helens, | ... | ... | ... | 126.44 |
| England (Towns), | ... | ... | ... | 152.39 (15.89.) |
| Manchester, | ... | ... | ... | 169.19 (12.) |
| Liverpool, | ... | ... | ... | 216.44 (23.64) |
| Glasgow, | ... | ... | ... | 557.78 (23.96.) |

Dr Smith remarks on the table, from which the above is derived—"This I consider a very remarkable table. It includes most of the other results, and gives a rough summary like a touch of common sense, simplifying the most tangled figures, and including organic matter and sulphurous acid." This latter refers to the figures in brackets, which represent the permanganate decomposed "instantly," the sulphurous acid from coal-burning and sulphuretted hydrogen acting at once, but the organic matter slowly.

The organized particles found in the air are again and again referred to in the usual reiterating style: but they have evidently exercised Dr Smith's best thoughts, and his various modes

of attacking the subject, by air-washing with permanganate solution or with pure water, and by microscopic investigation, are all satisfactory as well as extremely interesting in their relations to health. Tyndall's simple demonstration to the eye of the presence of solid particles in the air, is fresh in our recollection. That the albuminoid ammonia is chiefly derived from the *insoluble* portion of air-washings, proves that a part of those solid particles must be organized. That those particles are unequally distributed in air, and that the inequality has some relation to sources of organic impurity, such as animal exhalations, or putrid effluvia, is easily demonstrated by washing the air of the localities in measured volumes in distilled water.* The naked eye detects an increasing milkiness of the fluid, the cause of which the microscope explains. "It invariably happens that the air of the country takes many more bottles to produce an effect on the water perceptible to the eye. The air of a cow-house will give an appearance to the water which will not be caused by good air, unless from fifty to one hundred times the amount is used. The air at the front street is decidedly better by this test than the air behind the houses, *in such towns at least as have open middens.*" Mr Dancer examined such a sample of Manchester air-washings, and found the particles to be chiefly fungoid matter, particles of charred wood, and other *debris* of the city. In various parts of the latter half of his work, Dr Smith enters into speculations and disquisitions upon the influence of these organized particles in the propagation of disease, which give rise to many useful thoughts, although they leave us still among mysteries. We confess, however, that the success with which he has managed to analyze, weigh, measure, even make gross and palpable, agents which have hitherto been rather conveniences of expression in etiological enquiries than *veræ causæ*, has made us more hopeful than we have ever been of some day dealing with the germs of disease with directness and precision, instead of vaguely, with much waste both of money and material, as at present.

We took exception above to Dr Smith's rain-analysis, especially as regarded Glasgow. Artificial air-washing is free from all the suspicions attaching to natural air-washing, where the collections extend over a long time and the fluid may have been concentrated by evaporation. The artificial washing is done at a certain spot at a certain time, and with a known quantity

* This air-washing is simply the jumbling up of air in measured quantity, with a fluid in a bottle, previously exhausted of its contained air, so as to imitate the air-washing of nature by rain. The method is described at p. 400, but not clearly.

of air, so that the result is not merely qualitative but quantitative, and every condition of weather and atmosphere, &c., can be recorded. The process is one which ought to be so simplified and clearly described (we confess Dr Smith has failed in this, so far as we are concerned) as to become in the hands of the sanitarian like the thermometer to the clinical student. At present, middens, and privies, and porous yards saturated with filthy fluids, are like magnets which act at a distance without discoverable medium—that is to say, they may act like magnets for all we can show to the contrary. But nothing can act where it is not, and the air-washing would enable us to trace through the surrounding air the otherwise undemonstrable effluvia.

Although we have now occupied so much space, we must give the following summary of results of air-washing, modified from the table on p. 438. The amounts are in grains per million cubic feet of air washed at the places mentioned. The figures in brackets are the number of experiments from which the averages are derived.

| | | | | | |
|---------------------|------|----------|---------------|---------------------|----------------|
| Inuellan | (1) | Ammonia, | 22·845 | Albuminoid Ammonia, | 60·228 |
| London | (18) | “ | 26·780 | “ | 65·947 |
| Glasgow, | (4) | “ | 34·169 | “ | 133·264 |
| A Bedroom | (3) | “ | 44·305 | “ | 104·118 |
| Manchester | (10) | “ | 53·582 | “ | 116·544 |
| Underground Railway | | | | | |
| (Metropolitan) | (2) | “ | 31·561 | “ | 163·167 |
| A Midden | (3) | “ | 146·911 | “ | 181·524 |

The Glasgow air-washings were made on 23rd February, and 1st and 2nd March, 1870, in a “Green in Elmbank Street,” “Union Street, near Argyle Street,” “Charlotte Street, Gallowgate,” and at “Finnieston Quay.” The results are not flattering as to the general character of Glasgow air.

In conclusion, we have only emphatically to express our opinion that every Medical Officer of Health and Sanitary Inspector should obtain, and make himself familiar with, Dr Angus Smith's “Air and Rain;” and we venture to add that our Public Analysts would probably do more good to the public health by accustoming the public to analyses of the adulteration of air, than by confining their attentions to food and drink, commonly so called. Health and Life are not destroyed by the nauseous gross adulteration, but by the repetition of minute impacts on the vital fabric, which first quivers and then falls. A man may eat bad butter once or twice a day, but if the air is bad, *he lives in it*, and he can no more free himself from its influence than Achilles could throw off the fatal garment of Nessus.

Clinical Record.

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I.—NOTES OF FOUR CASES OF TRACHEOTOMY.

Communicated by Dr R. W. FORREST.

The following are all the cases of tracheotomy which have occurred in Dr Forrest's practice. In three of them the operation was performed by Dr Dunlop, and in the fourth by himself.

CASE I.—*Diphtheria: Treatment by antimony and steam; improvement, followed by relapse; local application of nitrate of silver; great relief, but a second relapse, with symptoms of impending suffocation; tracheotomy; tube worn for two years; closure of wound nine months after removal of tube; ultimate recovery.*

This patient was seized with laryngeal symptoms on 31st August, 1868. He was the second attacked of a family of seven, five of whom suffered more or less severely from diphtheria. The first affected—a girl aet. seven years—died from apnoea, resulting from laryngeal affection. Two of the other children had laryngeal cough; the mother had sore throat slightly, and the father severely. In the case of the father, the soft palate and the pharynx were dusky red, and dotted all over with diphtheritic-like exudation. Lastly, the eldest, a boy aet. 12, was seized with laryngeal symptoms, which rapidly subsided under treatment, and disappeared completely in a few days.

Alex. G., aet. 5 years, was seized about thirty hours after his sister's death. When seen by Dr Forrest in the morning, his pulse was very quick, and the skin was hot. He had laryngeal cough, and difficult sibilant inspiration. Prescribed emetic of antim. tart., to be followed by nauseating doses of the same drug during the day; the patient to be kept in an atmosphere saturated with steam.

Evening.—Cough comparatively unfrequent, laryngeal symptoms very much abated. Steam and small doses of antimony were ordered to be continued.

September 1st.—Laryngeal symptoms having become very much worse during the night, Dr Dunlop saw him in consultation, and suggested the application of a solution of nitrate of silver (ʒi. to ʒi.) every four hours. At his suggestion also, the dose of the antimony was diminished, and food administered by mouth and rectum.

Patient again rapidly improved, and on the following day so little of the laryngeal symptoms remained that the danger seemed over. The solution of nitrate of silver was still applied, but at longer intervals, and chlorate of potash was given freely. Greyish spots of exudation were now seen for the first time on the tonsils, and some patches also at the angles of the mouth, and on the tongue where the surface had been abraded by the gag.

3rd.—In the morning, the laryngeal symptoms were more marked, and patient got rapidly worse during the forenoon. In the afternoon, suffocation being apparently imminent, Dr Dunlop, with very little trouble, opened the trachea, the boy being under the influence of chloroform. The lividity rapidly disappeared, and the respiration became easy. The antimony was now entirely discontinued, and small doses of calomel and opium were prescribed. Treatment otherwise the same as before the operation.

On the fourth day after the operation, the tube was removed. As the wound contracted, breathing gradually became more and more difficult, and, on the second day after the removal of the tube, the dyspnoea had become so great that it was thought advisable to introduce it again.

12th.—The tube was again removed, but had to be replaced immediately.

20th.—Seventeen days after the operation the tube was removed, but, before two hours had elapsed, dyspnoea had become so serious that it was reintroduced. It may be here noted that the voice had returned shortly after the operation, and that nothing abnormal could be detected on laryngoscopic examination.

September 10th, 1870 (two years after operation).—The tube was removed, and no bad symptoms followed.

June 8th (two years and nine months after operation).—As it was now found that adhesive plaster could be worn over the wound for hours together without inconvenience, the child was put under chloroform, and Dr Dunlop paired the edges of the opening, and brought them together by silver sutures.

9th.—Patient passed a quiet night, took breakfast heartily, and seemed quite well.

10th.—Last night breathing became difficult, and laryngeal cough set in. Ordered fomentations to throat, and small doses of calomel and opium.

11th.—Passed a very restless night; spasmodic dyspnoea very severe from 1 till 5 A.M.; much better this forenoon. One or two of the stitches were removed; chloral was ordered to be given at bed-time, and to be repeated if spasm came on.

12th.—Spasm severe from 2 till 4 A.M., recurring every twenty minutes, but considerable improvement towards morning. Cough still hard. Remaining stitches were removed, and adhesive plaster substituted. Chloral was ordered to be continued.

13th.—During the night dyspnoea on the whole not so violent. Patient had a very severe spasm at 4 A.M., lasting seventeen minutes.

14th.—Spasm occasionally during the night; most severe from 3 till 5 A.M.

15th.—Slept well till 4 A.M. From 4 till 6 A.M. spasm frequent, but not so severe as formerly. Cough still slightly laryngeal. From this time the local irritation, and with it the constitutional symptoms, gradually abated, and convalescence became finally established.

January 14th, 1873.—Boy continues well.

CASE II.—*Laryngeal symptoms during convalescence from measles; temporary recovery under treatment by local and general remedies; tracheotomy; death on the fourth day after the operation from acute cellulitis.*

D. —, male, aet. 3 years, seen for the first time on 3rd May, 1869, suffering from a moderately severe attack of measles. Laryngeal symptoms set in with considerable severity on the fourth or fifth day after the appearance of the rash, but gradually abated under treatment by steam, antimony, and the local application of nitrate of silver.

On the 20th, laryngeal symptoms returned, the treatment proved unavailing, and on the 22nd dyspnoea had become so urgent that tracheotomy was advised, and performed without difficulty by Dr Dunlop. Immediate relief was afforded, and continued for twenty-four hours, when acute cellulitis was observed in the neighbourhood of the wound; difficulty of breathing again set in, and the child gradually sank, and died on the fourth day after the operation.

CASE III.—*Sloughy sore throat; sudden onset of laryngeal symptoms; tracheotomy; expulsion of membranous cast; great temporary relief; death thirty-six hours after the operation, probably from extension downwards of the disease.*

C. —, male, aet. $3\frac{1}{4}$ years, seen on 8th September, 1870, suffering from sore throat and feverishness. Both tonsils presented a sloughy aspect. Cases of malignant scarlatine had occurred in the tenement, but no rash was seen in this case at any time.

The throat gradually improved under treatment, the fever abated, and the child seemed recovering its general health till the 13th September, when laryngeal cough and stridor suddenly supervened.

The local application of nitrate of silver was now tried, but the distress became rapidly so urgent that, on the morning of the 14th, tracheotomy was advised and performed by Dr Dunlop. A tube of false membrane, about an inch in length, was ejected through the opening. The child recovered rapidly from the urgent symptoms, but gradually dyspnoea set in which seemed to be due to extension of the disease below the opening, and death ensued thirty-six hours after the operation. No inspection.

CASE IV.—*Broncho-Pneumonia; laryngitis; temporary improvement; return of laryngeal symptoms with great severity; tracheotomy; ultimate recovery.*

— II., female, aet. $3\frac{1}{2}$ years. During convalescence from measles she became suddenly very ill, and was visited on the morning of 10th July, 1870, and found to be suffering from cough having a markedly laryngeal character. A little fine crepitus was heard over the lower lobe of the left lung behind, and a few coarse râles were audible all over the right back. There was no difficulty of breathing.

Prescribed an emetic of equal parts of the wines of antimony and

ipecacuanha; nauseating doses to be continued during the day; hot fomentations to be applied to the throat; poultices of linseed meal, with a little mustard to the back. As the child lived at a distance, the parents were desired to send word if she did not improve.

July 15th.—Child had continued pretty well till yesterday evening, when laryngeal cough had set in again, attended this time with great difficulty of breathing.

An emetic of salt and water had been administered, and hot moist applications had been kept all night continuously to the throat, but without giving relief.

There was now frequent laryngeal cough; inspiration very difficult; expiration comparatively easy; voice gone; very little respiratory murmur; lips and fingers livid; pulse about 160 weak, and counted with difficulty.

Chloroform having been administered, the trachea was opened by Dr Forrest. Breathing at once became easy, and lividity disappeared. Steam was ordered to be kept continuously playing about the child's bed, and chloral was prescribed to induce sleep, and allay the constant spasmodic cough.

18th.—Pulse 120-130; respiration easy; coarse râles very abundant on both sides behind; slight dulness at base of left lung.

August 4th.—Respiration can now be carried on through the mouth for short periods—the orifice of the tube (a bivalve one) being stopped by a cork.

8th.—Cough still continuing, the tube was removed.

12th.—Cough gradually abated after the removal of the tube.

Wound quite healed. Child convalescent.

In this case ammonia and wine were administered very freely for three or four days after the operation, then a mixture of iron, quinine, nitrous-ether, and nitro-muriatic acid, was prescribed, and continued for some time.

December, 1872.—The child continues well.

II.—CASES FROM DR ROBERT PERRY'S CLINIQUE.

CASE I.—*Exophthalmic Goitre, with Cardiac Disease and Extensive Aortic Dilatation.*

P. R., labourer, married, aged 47 years, was admitted into the Glasgow Royal Infirmary on 2nd December, 1868. He felt his present illness commencing about three months ago with pain in the epigastric region, not accompanied with any dyspeptic symptoms, or any alteration of the regular action of the bowels. This pain continued for about a week, when it ceased for about eight days, and again recurred for a day or two. About a fortnight later he had a rigor, followed by pyrexial symptoms and a cough without any expectoration. The short, dry cough still continues, but is gradually becoming less severe. About

a month ago he first noticed a beating at his heart, or a "purring," as he himself calls it. This beating came on gradually, and at first attracted his attention by its occurrence after any little exertion. It has progressively increased in severity, but more rapidly during the last eight days, and is now constant, whether he is exerting himself or lying at rest. The palpitation is not intermittent in character, and is of the same intensity from day to day.

He never had rheumatic fever, but has had what he calls rheumatism in the right leg from the knee downwards. There is not any acute pain, but rather a sensation of coldness in the parts mentioned.

His appetite is pretty good. Tongue clean. Bowels rather sluggish.

Pulse 80, full, and very soft. The pulse in the right radial artery is considerably stronger than that in the left, and preceeds it in point of time. The same condition of the pulse is more markedly felt in the carotids, while in the femorals there is no apparent difference between the right and left sides. The right pupil is much more dilated than the left, but quite sensitive to light.

Patient has a slight lateral curvature of the spine in the dorsal region, with the convexity towards the right side. This, he says, was the result of a fall many years ago. The heart's apex beat is felt about two inches below and a little to the right of the vertical line of the nipple.

The cardiac dulness is somewhat increased in extent, and from the base of the heart there is an additional area of dulness of about 2 inches in breadth, and extending upwards towards the top of the sternum.

In this situation the patient complains of some pain upon pressure, and on deep pressure in the same situation something like pulsation can be detected, but by no means distinctly. Auscultation reveals at the heart's apex a clear, loud, and prolonged first sound, with a very faint and muffled second sound. At the base both sounds are faint, and much obscured by a constant rushing sound. When more carefully listened to, this sound can be made out as a double murmur, which can also be traced in the course of the aorta over the dull area above the heart, before mentioned.

There is a slight dulness on percussion towards the apex of the left lung in front and weakened respiratory murmur, without other alteration. The whole of the right side of chest is slightly dull posteriorly, and there is some deficiency in the respiratory murmur towards both apices behind. At this time there was no enlargement of the thyroid gland, and no exophthalmos. He was put upon 10 minim doses of Tincture of Digitalis three times daily, and under this treatment improved so much that, at his own request, he was dismissed on the 4th Jan., 1869. The arterial murmurs by this time had almost disappeared.

Re-admitted, November 8th, 1869.—He states, that on leaving the hospital he resumed his work, and was pretty well till three months ago, when he was seized with pain on the top of the head, for which he was successfully treated outside. About a month since he caught a cold, and

shortly after the cardiac symptoms returned with such severity as to force him to stop work.

On admission, the cardiac symptoms are similar to what was reported at the time of his first coming into hospital. There is now, however, a considerable swelling of the thyroid gland, and a very marked prominence of the eyeballs.

The right pupil is still more dilated than the left. He says that the eyeballs were much farther protruded last week than they are at present, and it was only about a month ago that he first observed anything to be wrong with them.

Nov. 29th.—Swelling of thyroid somewhat increased, and pulsating considerably. Heart's action more tumultuous.

| | | | | |
|--------------------|-----|-----|-----|----------|
| R̄ Tinct. aconiti, | ... | ... | ... | 3i. |
| Aq. font, | ... | ... | ... | 3iss. M. |

Sig. A tea spoonful three times a day, and omit the digitalis.

Dec. 7th.—Symptoms disappearing considerably; omit aconite mixture.

| | | | | |
|-------------------|-----|-----|-----|---------------|
| R̄ Potass Bromid, | ... | ... | ... | 3ss. |
| Infusi Quassiaë, | ... | ... | ... | 3xiii. Solve. |

Sig. A table spoonful three times a day.

Dec. 17th.—Dismissed by desire, considerably improved, and sent to Convalescent Home.

April 26th, 1873.—Since last report patient has not been under any regular treatment specially adapted to his complaint. Although nominally still at work, he is allowed to do, through the indulgence of his employers, what he feels able for, which amounts to very little, as he is not fit for any physical exertion.

His eyeballs are now very prominent, and look as if about to fall out of the orbits. The right and left lobes of the thyroid gland are each above the size of a turkey's egg, and pulsate violently. The isthmus is not so large in proportion. The heart's action is very rapid and tumultuous. All his symptoms become very much aggravated upon the slightest excitement, and sometimes without any apparent cause.

CASE II.—*Exophthalmic Goitre, with Acute Articular Rheumatism, and Bronchitis.*

C. W., aged 34, power-loom weaver. Patient was admitted 24th February, 1873, complaining of palpitation, swelling of the throat, prominence of the eyeballs, cough, spit, shortness of breath, occasional swelling of the abdomen, and severe pain in the left knee. With the exception of a cough, which she has had for some years, she enjoyed very good health till last July, when she took her present illness.

Palpitation began then, and at the same time her legs and feet commenced to swell. The palpitation has very much increased, whereas the swelling of the legs is only very slight and occasional.

Seven weeks ago her throat began to swell, and at the same time her eyes were noticed to be more prominent than formerly. They increase in prominence under excitement, but she had not observed this to be the case while menstruating.

She has had leucorrhœa for many years, but her catamenia were quite regular till two months ago, when they ceased. She is not pregnant.

She feels herself to be more peevish in temper and more irritable than formerly. She has frequent emotional flushings. She has never had epistaxis. There is a frequent sensation of heat in the throat, and she perspires much. She has lost a good deal of flesh.

Family History.—Father died of fever, and her mother of apoplexy. She had two brothers and two sisters burned in Chicago. Patient has had one child, who, she thinks, died of consumption. The child was born five years ago.

Physical Examination.—The most noticeable feature in looking at the patient is the prominence of the eyeballs, which are so far uncovered by the eyelids as to show the sclerotic almost encircling the cornea. Her sight is not so good as it used to be.

There is a slight enlargement of the thyroid gland, the right side being larger than the left. By the stethoscope a distinct bruit is heard over the tumour synchronous with the pulse.

The chest walls are rather thin, and the percussion note is clear over both lungs. The respiratory murmur is rough in character in the upper part of both lungs anteriorly and posteriorly, and mucous crepitation with an occasional sibilant ronchus is heard at the bases. On placing the hand anywhere over the chest, the throbbing of the heart is felt, although its action is slower than natural, beating only 60 times in the minute. The area of dulness is slightly increased and a blowing ventricular systolic murmur is heard over the aortic valve. The carotids throb violently, also the aorta and femoral arteries.

The liver dulness is normal in extent, but the organ is depressed.

She states that she has a small inguinal hernia on the right side, but this is not at present visible.

There is a puffiness of the inner side of the left knee, not in the joint, but in the tissues outside. She complained of pain in it six days ago, and turpentine was applied. She did not observe the swelling of the knee until the application of the turpentine cloths. The pain is so great that walking is impossible.

The tongue is moist and clean; the bowels are loose; the appetite is bad; and she has sleepless nights. She has always a sense of fulness in the stomach after a meal, and eating aggravates the palpitation. The pulse is full and jerky. Number of beats per minute, 60. Temperature, 100·8° Fahr. Urine acid, sp. gr. 1025; no albumen.

Ordered quinine and expectorant mixture, also four ounces of sherry, and half a drachm of bromide of potassium at bed time.

April 7th.—Since admission patient has passed through a severe attack of acute rheumatism, affecting nearly all of the larger joints in succession, and accompanied, at the same time, with severe bronchial inflammation. The rheumatic symptoms are now nearly gone, and the bronchitis almost quite well. To have 15 grs. of bromide of potassium three times daily, and four ounces of sherry, with full diet.

26th.—Since last report patient's symptoms have varied considerably from day to day, but the enlargement of the thyroid gland is, if anything, greater. Her general health has very much improved, and she is now able to be out of bed nearly all day. Still to continue the same treatment.

CASE III.—*Exophthalmic Goitre, with marked Pigmentation of the Skin.*

J. S., aged 21, unmarried, weaver, was admitted into the Glasgow Royal Infirmary on November 20th, 1871.

The patient states that up till about twelve months ago she was perfectly well, and had always enjoyed very good health. At that time she first observed that her skin was becoming darker in the colour than what it used to be.

Six months ago she noticed a small swelling at the lower part of the front of the neck, almost central in position, but tending towards the right side. About the same time she and her friends observed that her eyeballs became unusually prominent. Shortly after this she began to complain of light occasional headaches, of palpitation at the heart, a feeling of extreme nervousness, and inability to work, owing to increasing weakness.

Family History.—She has never at any time lived far from Glasgow. Her father is alive and well; her mother died nine years ago from dropsy; her brothers and sisters are all alive and in good health. She is not able to assign any cause for her present illness.

Examination.—Patient is rather under five feet in height, her body is well developed, and has a strong tendency to obesity. She is of a very excitable disposition, is very shy, flushing in the face when spoken to by a stranger. When she rises she feels giddy, and her limbs shake and give way under her. At present the most remarkable feature is the prominence of the eyeballs, which gives her an expression of astonishment; and the protrusion of the eyeballs becomes more marked when she is excited. The left eyeball is rather more prominent than the right one, but the eyelids are quite able to cover both of them when closed. The eyes are clear and brilliant, and there is no defect of vision.

The isthmus and right lobe of the thyroid gland are enlarged, and pulsation is distinctly felt in it when two fingers are placed on opposite sides of the tumour, but the fingers are not distinctly driven apart at each pulsation.

On applying the stethoscope over the tumour, a loud systolic bruit is detected. This murmur is heard in the arteries of the neck on both sides, but of greater intensity on the right side. The heart's sounds are normal,

but its impulse is increased, and its action readily becomes excited by examination. The pulse is 140 and of fair strength. Temperature is about 100° Fahr., and patient frequently perspires a good deal. The skin is of a dark bronze colour, similar to that in a well marked case of Addison's disease. The pigmentation, however, is not in patches, but uniformly diffused over the surface of the body, and rather deeper in hue on the face than elsewhere. She is under the impression that the depth of the coloration varies from time to time, but she is not aware if the change of colour occurs about the menstrual period. No coloration of the lips or mucus membranes is visible.

The menstrual functions are irregular, the interval between the discharges varying from a month to six weeks, and continuing from one to three days. The flow is always scanty, and since her other symptoms began she has occasionally suffered from leucorrhœa. Her bowels are generally constipated. She is very restless at night, and says she has slept none for the last four days.

Bromide of Potassium in half drachm doses was administered at bed time, and Tincture of Aconite in 5 minim doses three times daily.

Remarks.—On the 27th of December, the patient left the Hospital very decidedly improved in every respect. The exophthalmos was so much less as to be scarcely observable when the patient was not excited. The palpitations had ceased, and the heart's action was much lessened. The arterial murmurs in the vessels of the neck and of the thyroid glands were very much diminished in intensity, and the tumour was reduced to one half of its former dimensions. An attempt was made further to reduce the size of the gland by the continuous application of ice-cold water, by means of the India-rubber neck belt invented by Dr Alex. Robertson, of the Town's Hospital, Glasgow. The patient, however, expressed a strong dislike to this method of treatment, and, after it had been used for a few days, she left the Hospital of her own accord.

I saw this patient about six months afterwards, and found that the improvement in all her symptoms still continued, but what appeared to be most gratifying to herself was the fact of the bronzing of the skin having in a great measure disappeared. What value ought to be assigned to the very peculiar complication in this case, viz., the pigmentation of the skin, I am at a loss to determine. Whether it is merely a coincidence, or to be looked upon as a symptom of this special neurosis, I leave as a question to be afterwards determined. I think it may at least be useful to record the fact. I have not seen a similar case, nor, as far as I know, had there ever been one such published.

A case, however, somewhat analogous to this has been since published in the *Gazette des Hopitaux* of February 4th, 1873. It occurred in the practice of M. Ball in the Hotel Dieu, Paris, in November, 1871. It is recorded as "*Goitre Exophthalmic*," attended with nervous disorder and vitiligo. The patient was a female, aged 24 years. At the same time as

the palpitation of the heart began, she saw some white spots develop themselves upon the skin, commencing upon the neck, and spreading from it to other parts of the body. There were large white spots, irregular in shape, upon the left side of the neck, and posteriorly in the neighbourhood of the spinous processes of the cranial and dorsal regions. A great number of small spots upon the arms, legs, breasts and face, and especially upon the upper lip: also, a white girdle round the body. The spots increased in size and number, and appeared from time to time upon new points. There were no pigmentary deposits.—R. P.

III.—CASE OF PHOSPHORUS POISONING.

Under the care of, and reported by WILLIAM MACEWEN, M.D., Casualty Surgeon.

At 11 P.M., on January 7th, 1873, I was asked to see a female who had turned suddenly ill, and who was supposed to have taken poison. I found a woman in the Central Police Office, apparently about twenty-two years of age, in an insensible condition, lying on a stretcher. She was at once removed to the "dressing room," and as she was conveyed thither, along a dimly-lighted passage, slight but distinctly luminous fumes issued from her mouth and nostrils, and four luminous specks appeared on the right side of her face. On being placed on the table in the "dressing room," exposed to a bright light, these fumes disappeared, and the previously luminous specks were found to consist of a greenish paste. An eructation took place, which further supported the evidence of the presence of phosphorus. The characteristic odour was accompanied by a most nauseous and foetid smell; so foul, indeed, as to induce vomiting in one of the attendants, and vertigo and tendency to fainting in the other, neither of whom had a very delicate perception of smell. Her pulse was normal in strength, but quick, excited, and slightly jerking. The pupils were normal and sensitive to light. The face was pale and expressionless, saving a faint remaining trace indicative of previous pain. The temperature of the surface of the body was below normal, and the trunk and extremities were bedewed with a cold clammy perspiration. The mucous membrane of the lips, mouth, and pharynx, seemed healthy, and bore no abnormal traces. The epigastric region was slightly distended, and from time to time a wreath of phosphorescent smoke escaped from the mouth and nostrils. Deglutition was lost. On two occasions a slight abortive spasmodic effort toward vomiting was evinced, such as is seen in the insensible from other causes. When the thorax was compressed the fumes of the phosphorus escaped from the mouth and nostrils.

Treatment.—Seeing that deglutition was in abeyance, and that the mucous membrane of the mouth and pharynx was in no way irritated, the tube of the stomach pump was carefully introduced, and a large quantity

of oil, which was at hand, was heated and passed into the stomach. It was left there for five minutes, and then pumped out again to give place to a fresh supply. At first, the pump brought up oil of a greenish colour, with a strong odour of phosphorus, and luminous in the dark. The stomach was thus treated until the oil which came from it was free from the peculiarities already mentioned.

Toward the end of the process, consciousness returned, and with it extreme gastric irritability, manifested by violent retching, which lasted incessantly for nearly ten minutes. Deglutition was restored and prompted by the severe burning pain, which she now experienced in the gastric region. She eagerly drank a quantity of oil, which, being retained, soothed the pain, and seemed to allay the irritability.

After recovering a little, she was able to walk across the room, but felt very weak, and complained of vertigo, and a severe gnawing pain over the stomach. The after treatment consisted of the administration of a purgative, opium, oil to drink, and the application of fomentations over the abdomen.

During the first 12 hours, she complained of an intense burning pain over the abdomen, and of great thirst. Water gave her little or no relief; but olive oil abated the pain, and quenched the thirst. Her bowels were fully moved. The gastric pain continued for the first two weeks; but, during that time, it was daily becoming less; and, on the 20th January, it was completely gone, when she resumed her work, though she still felt weak.

History.—From her own statement, it appears that she had had a quarrel with a friend, the result of which was that she determined to poison herself. For this purpose she entered a druggist's shop to ask for arsenic, but forgetting the correct name, and only being able to make several attempts to pronounce the word, the druggist refused to give it. Afterwards she returned, and asked for a pennyworth of poison for killing rats, and on being told that the jars containing it cost threepence each, she went away for the other twopence, and returned in half-an-hour with the money, and purchased the rat-poison. She took this home, scooped the contents of the jar out with the handle of a spoon, placed them in water, and swallowed them as a bolus. She then went into her own room to go to bed; but before she could undress, a burning pain in the stomach commenced, and shortly after became very intense, and a "sour choking smoke took away my breath, and forced me to cry out." She further stated, that she remembered nothing from this time till she recovered consciousness in the Central Police Office.

An intelligent detective officer, who had been called in along with the police, found her in a very excited condition in the middle of the kitchen floor, screaming and jumping, apparently in great agony, one of her hands being pressed over the right side of the abdomen. At this time she would not, or could not, answer any questions, and soon after she fell on the floor in a faint, and he believed her to be insensible. She was immediately

thereafter conveyed to the Police Office on a stretcher. As far as can be ascertained, half-an-hour at most elapsed between the taking of the poison and the time when she was first seen by me. The jar, with a small quantity of the greenish paste adhering to the sides, was found in the house along with the spoon with which she had scooped the poison out of the jar. The label which it bore was marked—"Roth & Reingeisen's patent vermin destroying paste."

On examining three jars, bearing a similar label, the contents were found to vary in weight. One contained 180 grs., a second 200 grs., and a third 240 grs. The amount of phosphorus also seemed to vary. One jar contained as much as 30 grs. of phosphorus in small pieces. One contained a piece of phosphorus weighing 10 grs., besides a number of small fragments, so that no accurate deduction can be made as to the amount of phosphorus she took, further than stating that she swallowed the greater bulk of the contents of one jar. The phosphorus does not seem to be held in any other than a mechanical mixture in these special jars.

The stomach pump was used here in preference to emetics, for the following reasons: deglutition was in abeyance. There were no contra-indications presented by the state of the pharynx. Emetics administered in the insensible are very varied in their results, whereas the pump is rapid and certain. Vomiting is always attended by hazard in the deeply insensible, owing to the aptitude of the vomited matter to find its way into the trachea, and sometimes, even with the greatest care, produces a fatal result. Even in those who have swallowed corrosive substances, and who do not offer resistance, it may be questioned whether the careful introduction of a well-oiled supple elastic tube would be productive of greater injury than by subjecting the stomach and œsophagus to violent spasmodic action, and to the sudden and forcible dilatation of the ejected matter.

Oil of Turpentine is generally stated to be the best antidote in phosphorus poisoning, and in an extract in the *Glasgow Medical Journal*, from a paper by Dr A. Vetter, Dresden, on Acute Poisoning by Phosphorus and its Treatment, we see that he recommends the *Oleum Terebinthinæ Gallicum* as the best preparation, 40 min. to be given in Mucilage and Syrup of Orange every fifteen minutes. Oil was preferred in this case, as it is a solvent of phosphorus, especially when heated, and it, at the same time, soothes and softens the eroded tissues, and coats the surface of the stomach.

The insensibility may be ascribed to the fumes of the phosphorus entering the lungs, the "sour choking smoke" which she felt, and, possibly, also the intense pain. There was a hysterical element in the case, which may have increased the symptoms at the outset of the poisoning, as on two occasions she had had hysterical fits.

IV.—CASE OF ENTERIC FEVER, IN WHICH THE COLD BATH WAS EMPLOYED.

Under the care of DR M'CALL ANDERSON.

Reported by ANDW. BLACK MORRISON, M.B., C.M., Resident Physician.

A. W., aet. 15 years, domestic servant, was admitted into Glasgow Royal Infirmary on Dec. 14, 1872, suffering from pain in the chest, back, and legs, with urgent cough, high fever, and great prostration. These symptoms were accompanied by very excessive diarrhoea, anorexia, and extreme thirst. Pulse, 120. Respirations, 24. Temperature, 104. Tongue dry, and thickly coated with a brownish-white fur. Face much congested, and conjunctivæ injected. Being in a state of semi-stupor, it was with difficulty that any history could be obtained beyond the fact that she dated the onset of her illness two weeks back after a thorough wetting. Musical râles existed all over the chest, and moist râles at the pulmonary bases, especially at the right. The cardiac action was obscured by the respiratory sounds.

Dec. 17th.—Pulse, 132. Resp., 38. Temp., 104.1°. This morning Dr Anderson expressed his belief that this is a case of enteric fever. No spots can, with any degree of certainty, be made out, but two or three suspicious points exist round the umbilicus. She complains much of pain in the abdomen—principally in the right iliac region—but no gurgling is detected. There is profuse diarrhoea, about twenty stools in the twenty-four hours. The evacuations are of the consistency and colour of thin pea soup, and are passed in bed. Chlorides are absent from the urine.

To have six ounces of brandy, with milk and eggs; body to be sponged with iced water; morphia injections subcutaneously if required; and a stimulating cough mixture.

19th.—Turpentine stupes to the abdomen, and to have two grains of Acetate of Lead every four hours. Temp., 104.1°. Cough mixture stopped.

20th.—Temp., 104.2°. In addition to the lead to have two grains of the Sulphate of Quinine thrice daily. Evening temp., 105°.

Dec. 22nd.—Pulse weak; 120. Tongue coated with a thick brownish yellow fur, and inclined to dryness. Cheeks flushed. Slightly delirious. Temp., 104.4°. Resp., 44. Takes an abundance of milk. Diarrhoea continues. The following was substituted for the previous medicines:—

| | | | |
|-----------------------|-----|-----|-------------|
| R Quiniæ sulphatis, | ... | ... | ... gr. 18. |
| Pulv. ipecac. compos. | ... | ... | ... ʒi. |
| Pulv. plumbi acet. | ... | ... | ... gr. 24. |

Divide in pulv. 12.

Sig. one every 4 hours.

23rd.—Pulse, 126. Resp., 46. Temp., 105.1°. Sordes on teeth. Brandy increased to twelve ounces.

1.30 p.m.—Pulse 134, regular, but weak. Resp., 48. Temp., 105.4°. No

motion from bowels since yesterday morning. Powders omitted. Dr Anderson to-day decided upon using the cold bath, in which patient was kept twenty minutes, the water being gradually cooled down from 84° to 70° . Before leaving the bath her temperature had fallen to 101.3° ; pulse to 120; and respirations to 42. Patient said she felt more comfortable. Cheeks less flushed and breathing quieter.

7 p.m.—Free motion from bowels; stool well formed; no blood.

10 p.m.—Temp. 102.2° . Resp., 48. Pulse, 120, jerking. Slept well from 8 till 9.40 o'clock. Skin now hot and dryish; breathing laboured; expiration accompanied by moaning; countenance flushed and swollen. Is quite intelligent.

24th.—Temp., 103.4° . Resp., 48. Pulse, 125, and of fair strength. Abdomen much less distended, soft, and not tender. Brandy reduced to nine ounces. Dorsal decubitus to be guarded against, and to change frequently from one side to the other. Chest to be drycupped night and morning. Head shaved.

25th.—Temp., 103.2° . Resp., 42. Pulse, 120. Bowels once opened during the night; stool well formed, and dark in colour. Tongue moist and cleaning. Bronchitic râles still abundant. Brandy reduced to eight ounces. Stimulating cough mixture renewed.

27th.—Bowels acting regularly, and stools becoming firm. To have beef-tea with isinglass and arrowroot.

29th.—Two bed sores have formed,—one over the left trochanter major, and the other over the sacrum. To be treated with camphorated oil and a water-bed supplied. Cupping stopped, but sinapisms to be alternately applied to the back and front of chest. Stools natural.

30th.—Temp., 100.4° . Pulse, 120. Resp., 44. Cough mixture stopped. Brandy diminished to six ounces, and to have two grains of quinine every four hours.

January 6th, 1873.—Brandy reduced to four ounces. The breathing is now natural, and all trace of bronchitis has disappeared.

28th.—Brandy stopped. To have 20 drops comp. tincture of cinchona thrice daily.

March 21st.—Dismissed perfectly well.

Exchange Journals.

By Dr JOSEPH COATS, *Lecturer on Pathology in Glasgow University, and Pathologist to Glasgow Royal Infirmary.*

VIRCHOW'S ARCHIV.

VOL. LVI., PARTS I. AND II., NOVEMBER, 1872.

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IV. On the identity of tuberculosis and pearl-disease of cattle, by Prof. Schüppel, Tübingen (Plate I.) V. On diphtheria, by Dr H. Senator, Berlin. VI. Heterotopia of the grey substance of the brain in the white medullary substance of the hemisphere of the cerebellum. Three observations, by Dr Fr. Meschede (Plate II., figs. 3, 4, 8 and 9.) VII. Hyperplasia of the grey substance in the medullary portion of the vermis cerebelli, by the same (Plate II., fig. 5). VIII. On the fatty and fatty pigimentary degeneration of the ganglion cells of the brain, in general paralysis of the insane, by the same (Plate II., figs. 6 and 7.) IX. On grey degeneration of the subcortical medullary substance of the cerebrum in certain cases of general paralysis, by the same (Plate II., figs. 1 and 2.) X. On the subcutaneous connective tissue and its relation to localised inflammations, by Dr W. Flemming, Prague (Plate III.) XI. Contribution to the etiology of Bright's disease, by Prof. H. v. Luschka, Tübingen (Plate IV.) XII. Contributions on the regulation of temperature, by Dr Winternitz, Vienna. XIII. On the formation of diverticula in the duodenum, by Dr M. Roth, Greifswald (Plate V.) XIV. On the microchemical relations of the hepatic cells, by Dr C. Bock, and Dr F. A. Hoffman, Berlin. XV. Supplement to the "Experimental contributions to the absorption of fat," by Dr S. Radziejewski, Berlin. XVI. Chemical contributions to the study of fever, by Dr W. Manassein, St Petersburg. Second article. The watery and alcoholic extracts of muscle and liver in febrile and starved animals. XVII. On the relation of the central parts of the nervous system to absorption. A contribution to the physiology of the tonicity of vessels, by Dr E. Heubel, Kiev. XVIII. Smaller communications. 1. Peculiar double formation in the hands and feet, by Dr Kuhnt, Hanover (Plate VI.); 2. The condition of the lymphatic glands in the absorption of extravasations of blood, by Dr Orth, Bonn; 3. Incarceratio herniæ mesogastricæ dextr. in consequence of abnormal formation of the mesentery, by Dr N. Dubay, Ofen; 4. Partial sclerosis of the brain of traumatic origin, by Dr. Th. Simon, Hamburg; 5. Obituary of Professor Moritz Fürstenberg. XIX. Extracts and Reviews: 1. *G. Armauer Hansen*, Contributions to the normal and pathological anatomy of the lymphatic glands; 2. Noteworthy passages from the papers of Christian Friedrich von Stockmar; 3. *Maximilian Schmidt*, Zoological clinique. Handbook of comparative pathology and pathological anatomy of animals and birds; 4. *Dr H. H. Ploss*: On the position of the woman during parturition among different peoples.

II. The Etiology of Leuchæmia (Mosler).—As a contribution to the etiology of this disease, whose causation is yet involved in doubt, the author relates two cases which he has observed. In one of these leuchæmia appeared to originate from a serofulous swelling of the lymphatic glands which had occurred after an attack of measles. In the other case the patient, after an attack of intermittent fever, sustained a traumatic injury to the spleen. After this leuchæmia developed itself. The author, who has had a pretty extensive experience of this disease, expresses the opinion that leuchæmia occurs in children more frequently than it has been supposed, and under circumstances where it has not been hitherto looked for. Many a case of supposed scrofula, rachitis, tabes meseraica, is really one of leuchæmia.

III. The Urine in Addison's Disease (Rosenstein).—After a pretty full review of the literature of Addison's disease, the author details two cases in which he has found that the daily amount of urea in the urine is less than the normal. He also finds that indican is abnormally present.

IV. Tubercle and the Pearl-Disease of Cattle (*Schüppel*).—The author of this paper has already made several contributions to the structure of tubercle, and in this paper he asserts the identity as to structure of the pearl-disease of oxen and tubercle in man. The pearl-disease, which is a pretty common affection among cattle in some quarters, attacks primarily the peritoneum or pleura, and then the lymphatic glands of the chest and abdomen, more rarely extending to the parenchyma of the lungs and liver. In the peritoneum it appears in the form of white fibrous nodules (whence the name) of a size as large as from a pea up to a cherry or a potato, and of a firm consistence. Notwithstanding the difference in naked eye appearance, the author looks on this disease as identical with tuberculosis. In the paper the structure of the pearl-nodules is considered first in the serous membranes, especially the peritoneum, where it is more easy of examination, and then in the lungs. In the former he finds that these nodules originate like the human tubercles in the formation of a giant-cell, which lies isolated in the midst of a quantity of granulation tissue. These giant-cells undergo various alterations, but are generally still to be detected in the centre of the nodule which is formed around them. Immediately around the giant-cell form numerous cells of an epithelial appearance, and these together compose the smallest pearl-nodule. Numerous such minute nodules go to form the tumours which are visible on the serous membrane. The author considers that neither here nor elsewhere is the pearl or tubercle nodule a lymphoid structure, the cells which have been considered lymphoid being due to alterations of the real tubercle cells. In the lungs he recognizes, in cases of pearl-disease where these organs are affected, a structure similar to that noted in the serous membranes, though here the inflammatory processes of the lungs themselves, which are produced by the new formations, obscure the structure. The author summarizes his results, which it will be seen, have somewhat important relations, in the following words, "In the pearl-disease there are present, in the pearl-nodules of the serous coats, as well as in the lungs and lymphatic glands, innumerable very small nodules or growthlets. And these nodules are, as regards structure, development, and even in their retrograde changes, identical with tubercle as it occurs in the different organs of man."

V. The Nature of Diphtheria (*Senator*).—This paper may be pretty fairly described as one of general denial. It concerns itself chiefly with the two questions as to the nature of diphtheria—namely, Does it depend on a definite fungus? and, What are its relations to croup? The former of these is answered in the negative. In reference to the second question, the author considers that in diphtheria there is no specific lesion of the mucous membrane. The specific poison of diphtheria acts as an irritant, and may produce various forms of inflammation, according to its intensity, and other circumstances. Thus he recognizes a simple catarrh, a pseudo-croupous, a croupous, and a properly diphtheritic inflammation, as all resulting in different cases from the same morbid poison.

VIII. Affection of the Ganglion-Cells in General Paralysis (*Meschede*).—The author has already, in a previous number of this Archiv, asserted that fatty degeneration, either alone or combined with pigmentary, of the ganglion cells, if not the only, is at least the most constant anatomical condition in general paralysis of the insane. He also referred the characteristic intense delirium of that disease to a congestive inflammatory process in the cerebrum, the fatty degeneration being a condition resulting from such processes. The fatty degeneration is not, therefore, to be looked

on as a disease by itself; it occurs as a result of various forms of disease, and in the present case is only an expression of the active congestive conditions which lead to the intense delirium. It is also pointed out that the degeneration of the ganglion cells results only from affections of the brain substance, and not of the membranes. Meningitis may occur without any such lesion resulting.

X. Source of Pus Corpuscles (*Flemming*).—This paper contains a series of experimental researches with a view to determine the condition of the loose connective tissue in inflammation. His conclusions chiefly refer to the much debated question of the source of the pus corpuscles, and other cells which appear in inflamed parts. In general, he agrees with Cohnheim in deriving these bodies chiefly from the blood-vessels. If at all, the fixed connective tissue corpuscles only take a very minor part in their productions, and never present the enlargement, division of the nuclei, &c., which have been described by some.

XI. Etiology of Bright's Disease (*Luschka*).—In this paper a case is reported, which is of considerable interest in relation to the etiology of Bright's disease, and the mode of production of albuminuria. It has already been proved that Bright's disease may be produced in animals by any means which prevents the free passage of venous blood away from the kidney, and which thereby increases the blood pressure within the kidney. In the present case, Bright's disease was apparently produced by a mechanical obstacle to the return of the venous blood to the heart, and is, therefore, a clinical confirmation of these experimental results. The mechanical obstruction was in the form of a tumour situated on the right auricle, and reducing the orifice of the vena cava inferior to a third of its normal size. The growth, which was of a partially fibrous structure covered with a calcareous layer, was nearly globular, and measured 19 Mm. (about $\frac{3}{4}$ of an inch) in diameter.

XIV. Microscopic Reaction for Glycogen in Hepatic Cells (*Bock & Hoffman*).—The authors of this paper, who have already made an important contribution to Reichert and Du Bois Reymond's *Archiv* on the artificial production of Melituria (see this *Journal*, Nov. 1872, p. 140), describe here certain observations on the microscopic characters of the hepatic tissue in relation to the presence of glycogen. They find that where glycogen is present in abundance, and a solution of iodine (Iodine 1·0, Potass. Iod. 10·0 Aq. 500) is added, the nuclei of the individual hepatic cells become prominently visible, and the cell contents in the neighbourhood of the nuclei take on a dark brown colour, the colour shading off towards the periphery of the cell. They found that where no glycogen is present in the cells treated with iodine the nuclei are almost invisible, and no such colouration of the contents as that mentioned takes place. The depth of the colouration with iodine was also observed to be in direct ratio to the amount of glycogen in the liver. They therefore conclude, that the substance which gives this dark colour with iodine is glycogen. It is worthy of notice that, in certain cases, the material was collected in the cells in the centres of the lobules, and, therefore, near the branches of the hepatic veins, and not so much in the peripheral cells, or those next the branches of the portal vein.

XVII. Relation of the Central Nervous System to Absorption (*Heubel*).—This paper is entitled a contribution to the physiology of the tonicity of vessels, and the series of experiments recorded in it seem to show

that it is chiefly by their influence on the contraction of the circular muscular cells of the vessels that the central nervous ganglia have any effect on absorption. The results obtained in the experiments are recorded in a series of propositions which advance by regular gradation. The encephalon, with the exception of the medulla oblongata, has nothing to do with absorption, and of the entire cerebro-spinal centres only the medulla oblongata and spinal cord have any relation to this process. On the other hand, any part of these is sufficient, if preserved, to keep up unaided the process of absorption, this being even the case when all the cerebro-spinal centres are destroyed except the lowest part of the cord. Absorption, however, ceases entirely whenever the entire cerebro-spinal axis is destroyed. As to the cause of this cessation of the process of absorption when the entire cerebro-spinal axis is destroyed, the author believes that it depends on the cessation of the circulation. The experiments were made on frogs; and it seems that when the brain and spinal cord in these animals is destroyed, though the heart goes on pulsating for a considerable time, yet the blood no longer circulates through the vessels. For the carrying on of the circulation there is required not only the pumping force of the heart, but a certain amount of contraction of the vessels (their tonicity), which keeps the circulating blood at a certain tension. When this tension is removed, then the pulsations of the heart simply distend the vessels, but do not forward the circulation, and this is exactly the case when the cerebro-spinal centres are destroyed. It has been long known that the medulla oblongata contains vasa-motor centres, which are concerned in keeping the vessels in that moderate degree of contraction to which the term tonicity is applied; but the present author asserts that such centres exist as well in every part of the spinal cord, and that so long as any part of the cord remains in communication with the vessels, their tonicity is to a certain extent preserved, the circulation is maintained through them, and absorption is still possible. The experiments also seem to show that the lymphatic vessels have little or nothing to do with the absorption of stuffs introduced into the tissues, but that this process is confined to the blood circulation. It should be noted that the actual fact of absorption was in these experiments determined by introducing substances which were either of very easy detection by chemical reaction, or had a very well marked physiological action. Ferrocyanide of potassium may be mentioned, as of the former category, and strychnia of the latter.

VOL. LVI., PART IV.

CONTENTS.—XXXII. Anatomical notices (continuation) by Dr Wenzel Gruber, St Petersburg (Plates XI. and XII). 1. On a process-like cylindrical projection of the anterior aspect of the superior angle of the scapula. 2. On a hygroma of the bursa mucosa subcoracoidea posterior subtendinosa. 3. On a hernia-like projection of the synovial membrane of the humero-scapular capsule. 4. On a hernia-like projection of the synovial membrane of the radio-carpal capsule into the sulcus radialis. 5. On a similar projection of the carpo-metecarpal capsule on the volar side of the carpus. 6. On a similar projection of the carpal capsule on the dorsum of the carpus. 7. Unusual position of an enormously large sigmoid flexure of the colon. 8. Course of the vena anonyma sinistra through the thymus (fourth case of the author). 9. Course of the phrenic nerve through a very narrow island in the subclavian vein. XXXIII. Contributions on tumours, by Dr M. Perls, Königsberg. XXXIV. On the muscles concerned in the twisting motion of the body, by Professor A. W. Volkmann, Halle (Plate XV). XXXV. Contribution on the action of ergotin, by

Dr A. Wernick, Berlin. XXXVI. Myeloplaques (myeloid cells) and absorption of bone, by Dr Georg Wegner, Berlin. XXXVII. On the sympathetic affections of the medulla of bone, in internal diseases, by Dr E. Ponfick, Berlin.

XXXV. **The Action of Ergotin** (*Wernick*).—The author has made a considerable number of experiments on animals, which, as well as the conclusions he deduces from them, are recorded in this paper. He finds that when ergot is injected subcutaneously, a considerable portion of it remains unabsorbed, as proved by examination of the seat of injection when the animals had been killed a considerable time after the operation. The introduction of ergot into the system, especially when made directly into the veins, produces contractions of the individual arteries in certain parts (especially, as observed by the author, the skin, muscles, intestine, bladder, pia mater of the brain and cord). This action is not affected by cutting the sympathetic nerve, so it seems to be a direct action of the ergotin on the muscular coat of the arteries. These changes in the calibre of the small arteries are not very obvious in the uterus, but perhaps this is on account of the arrangement of the vessels in this organ. It was, however, further observed that the ergot produced contraction of the uterus at a period later than these changes in the vessels of the parts mentioned above, but yet that the contractions preceded the changes in the blood supply in the uterus indicated by its becoming paler. From this it is concluded that the contractions of the uterus are probably produced by irritation (anæmic stimulus?) of the centres in the brain or high in the cord. And this view is confirmed by the fact that they did not occur when the cord was divided. To the experimental portion of his paper, the author adds some therapeutical observations, made chiefly in treating cases of uterine hemorrhage with ergot. The following are his conclusions:—(1) The subcutaneous injection of ergot, especially in anæmic persons, stops uterine hemorrhage pretty quickly and permanently without any considerable unpleasant results; (2) The fact that a considerable portion of the fluid extract remains unabsorbed after subcutaneous injection renders the agent less trustworthy and the dose more difficult to regulate.

XXXVI. **Myeloid Cells and the Absorption of Bone** (*Wegner*).—This paper, by Virchow's principal assistant at Berlin, contains a number of observations, which have led the author from the pathological side to conclusions very similar to those arrived at by Kölliker from the normal histological and developmental side. Wegner has studied the process of absorption of the bony tissue in cases of disease of the brain with hydrocephalus, in atrophy of bone from the emaciation of old age, from cancer, etc., and in cases of rarefaction of the bone in the neighbourhood of caries, periostitis, etc. From all these observations, as well as from the study of the conditions in normal growing bones, he comes to conclusions which we cannot better express than by quoting his own words. "The process of absorption of bone, both pathological and normal, may be described as follows:—In a part where the bone is about to be absorbed, there occurs in the neighbouring tissue the dura mater, periosteum, medulla, etc., a cellular growth in the walls of the blood vessels; the products of this growth are many nucleated cells, which push themselves forward in the form of thick bodies or thin plates, against the osseous tissue; the pressure caused by their growth induces the bone to become absorbed before them, and they thus gradually bury themselves in shallower or deeper pits or lacunæ. If the surface to be absorbed is flat, then these cells grow in great part laterally, their oppressed processes come in contact and coalesce, and so

there is formed a kind of fenestrated membrane, presenting all degrees of fenestration up to a continuous layer formed of a granular substance containing innumerable nuclei. When the thin superficial layer of bone has disappeared, then these myeloid cells develop into vessels, or fibrous tissue, or perhaps into medullary cells. If the process of absorption goes further, then the vessels, which now lie on the surface of the bone, undergo similar changes in their cells, and so layer by layer there is an insensible absorption, and this process is always conducted on the same plan, whether the surface to be absorbed is on the surface of a bone or in its interior."

XXXVII. The Medulla of Bone Analogous to the Splenic Tissue (*Ponfick*).—This author, whose name is known in connection with the study of leucæmia, gives here a considerable number of observations, in which the condition of the medulla of bone was investigated in different diseases. Thus he has investigated it in thrombosis and embolism of the vessels of the limbs; in tumours; in cases where there was extensive amyloid disease; in senile and other marasmus; in endocarditis verrucosa; in morbus maculosus Werlhofii (purpura hemorrhagica); in leucæmia; in pseudo-leucæmia; in typhoid fever, and other acute febrile affections. He considers that the medulla is analogous in many pathological relations to the tissue of the spleen. He agrees to ascribe to the spleen and medulla a function by which the old red blood corpuscles are disposed of, as well as new ones formed. One of his observations is worthy of special notice, namely, the fact that in acute miliary tuberculosis the medulla contained beautiful and characteristic tubercles in large numbers.

VOL. LVII. PART I., FEBRUARY, 1873.

CONTENTS.—I. The action of cold water on the spleen, by Prof. Fr. Mosler, Greifswald. II. Contributions on small-pox, by Dr Otto Obermeier, Berlin. Article 2. On the relations of menstruation to small-pox. III. Contributions on cerebro-spinal meningitis, by Epaminondos Kotsonopulos, Nauplia. IV. Poisons, and their cure, a treatise of Moses Maimonides, written to the order of an Egyptian Vizier (1198). Edited from an unpublished Hebrew translation (along with a supplement on the family Ibu Zohr), by M. Steinschneider. V. On the changes in the sympathetic nervous system in syphilis, by Dr P. Petrow (Plate I., figs. 1-3). VI. The mode of formation of the free bodies in joints, by Dr A. Weichselbaum, Vienna (Plate I., figs 4-5). VII. Smaller contributions, 1, A case of Atresia hymenalis, by Dr E. Kotsonopulos, Nauplia. VIII. Extracts and Reviews. Yearly report on the condition of medical matters, of the hospitals, and of the sanitary relations of the city of Frankfort-on-Maine.

I. The Action of Cold Water on the Spleen (*Mosler*).—The author is of opinion, from a number of experiments and clinical observations, that cold water applied to the skin of the abdomen causes contraction of the spleen, and hence this agent may be made use of in ague. In this respect, however, cold water presents no advantages over quinine, and when strenuously carried out it presents considerable disadvantages, such as chilling of the body, &c. In both recent and old cases of intermittent fever, the author would combine cold water, in the form of baths, the cold douche, or the ice bladder, with the simultaneous use of quinine, and this combination is better than either separately. In chronic enlargements of the spleen (such as exist in leucæmia and pseudo-leucæmia) a similar treatment is also followed by good results. In these cases, however, the

author recommends that chinoidin should be substituted for quinine, as its effects are equally good, and this drug is much cheaper. This may be a serious consideration where, as in the case of leuchæmia, the treatment may extend over a long period.

II. The relations of Menstruation and Small-pox (*Olermeier*).—From the statistics of a considerable number of cases, the author comes to certain conclusions in respect to menstruation. The most remarkable of these is that in nearly half the cases the normal menstrual period falls in with the primary stage of the small-pox. The only likely explanation of this is that the period of incubation of the small-pox is modified in its duration by its relation to the menstrual period. Again, taking all the cases together, menstruation generally begins in the primary stage (in three-fourths of the cases), and is most frequently present at the time of the eruption. But from the fact already mentioned it is apparent that this does not imply a disturbance of the menstrual period nearly so frequently as at first sight might seem probable, in fact, there is this disturbance only in about a fourth of the cases. Of the cases in which the period is disturbed the most show acceleration; retardation or omission of the menses during small-pox is rare. After the attack of small-pox, the menstruation is generally weaker than usual, and later in date.

III. Cerebro-spinal Meningitis (*Kotsonopoulos*).—Since his first communication on epidemic cerebro-spinal meningitis (see this *Journal* for May 1871, p. 414) there have been two limited epidemics in Nauplia, in the first of which seven cases occurred, and in the second, four. Of these only three recovered. The symptoms were very much like those in the former epidemic. Four post-mortems were made, and he found in three of these plastic and purulent exudation, in one only hyperæmia of the membranes of the brain and cord. The author also gives some further account of the progress of the cases which recovered in the first epidemic. During the period of two and a-half years which have elapsed, the author has had almost daily opportunity of watching these cases, such as only one practising in a small town can have. He reports that of the 37 cases which recovered, 30 had a complete recovery, and seven an incomplete. In these seven cases the sequelæ still remain after the lapse of $2\frac{1}{2}$ years. Of the seven, three are completely deaf, one hears only with the right ear, two are deficient in hearing, and the seventh has had a maniacal attack. The patient who hears only with the right ear was an epileptic, subject before the attack of cerebro-spinal meningitis to fits almost every month. But during these $2\frac{1}{2}$ years he has only had one epileptic attack, so that the cerebro-spinal meningitis has rather had a curative action.

VI. The Genesis of Free-Bodies in Joints (*Weichselbaum*).—Whatever be the usual mode of formation of the free-bodies in joints, there are undoubtedly cases on record in which they have been formed of pieces broken off from the cartilage covering the ends of the bones at the joints. The author here records a rather remarkable case in which he found a free-body in each elbow joint, which had evidently such a traumatic origin. The said free-bodies were formed of cartilage with a thin layer of cancellated bone beneath, and he found in both joints, and at a similar part of the radius, a loss of substance corresponding to the form of the free-bodies. The mode in which the fracture had been produced it was not possible to find. It is, however, suggested that in falling the patient may have thrown forward both hands, and so produced a simultaneous injury to both joints.

VII. Case of Imperforate Hymen (*Kotsonopoulos*).—The obstructing membrane was higher than the normal hymen. The distended uterus was relieved by puncture, and the cure was complete.

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

PART II. 1872.

CONTENTS.—I. Contributions to the zoological and zootomical knowledge of the so-called anthropomorphous apes, by R. Hartman (*continued*) (Plate V.) II. The physiology of the cerebro-spinal fluid, by Dr H. Quincke, Berlin. III. Contribution to the anatomy, physiology, and pathology of the lens of the eye, by Dr Robinski (Plate VII.) IV. On the influence of the nerves on nutrition and new formation, an experimental study, by Dr H. Joseph, Berlin. V. On the pathological anatomy of the blood, by Dr L. Riess, Berlin (Plate VIII.) VI. Remarks on Dr Fr. Merkel's paper "On the processes of development in the interior of the seminal tubules," by V. v. Ebner, Innsbruck.

II. The Cerebro-Spinal Fluid (*Quincke*).—This paper gives the results of a series of experiments made with a view to determining the various motions and channels of the cerebro-spinal fluid in living animals. An emulsion was made of vermilion rubbed down in solution of sugar, and this was injected in small quantity into the subarachnoid space of the cord in one series, and into the cavity of the dura mater (so-called arachnoid cavity) in a second series. The quantity introduced was always very small, rarely exceeding 1 CC., so that there could be no suspicion of a forcible injection of the vermilion so as to reach distant parts, and any vermilion which was ultimately found at a distance from the point of introduction must therefore have been carried by the vital movements of the cerebro-spinal fluid itself. From these experiments various conclusions are deduced. (1.) There exists a communication between the subarachnoid space of the brain, and that of the cord; for vermilion introduced into the latter was afterwards found in the former. (2.) In the subarachnoid space there exists a current during life, which flows as well from before backwards as from behind forwards; for granules of vermilion were carried as well from the subarachnoid space of the cord to that of the brain, as *vice versa*. These currents are probably related to respiration. (3.) Communications exist between the so-called arachnoid space of the brain and the subarachnoid space; for after injection of vermilion into the former, it was found to have passed through the arachnoid into the latter. But the current of the cerebro-spinal fluid must flow from the arachnoid to the subarachnoid space, because, when the vermilion is introduced into the subarachnoid cavity in the cord, it does not pass into the arachnoid cavity of the brain, although it reaches abundantly the subarachnoid. (4.) It seems probable that a considerable quantity of the cerebro-spinal fluid leaves the brain and spinal cord by the nerves. This path of exit appears to give passage to the fluid, but not to solid granules, for the vermilion was in most cases caught at the points of exit of the nerves, being accumulated there as if it had been filtered from the fluid in which it had been suspended. In rare cases did the vermilion extend beyond the points of exit of the nerves, and when such was the case it was usually the intercostals and lumbar nerves. The optic nerve forms, however, an exception to this general rule, its sheath being in more direct communication with the subarachnoid space, and always in these experiments containing vermilion granules. With this mode of exit of the cerebro-

spinal fluid, the author associates the fact of the sudden death of certain of the animals experimented on, within from six to twenty hours after the injection. Death seems to have occurred in these cases from increased intra-cranial pressure, and yet the mere amount of fluid introduced was never sufficient to cause such an increase, as was proved by the fact that the animals never showed these symptoms immediately after the operation. The author supposes that the vermilion granules may have mechanically obstructed the apertures of exit of the fluid, and so caused an accumulation of the fluid and increased pressure. The aggregation of the vermilion granules just at the supposed apertures of exit, namely, the points where the nerves leave the spaces, gives colour to this idea.

IV. The Influence of the Nerves on Nutrition and New Formation (*Joseph*).—This paper contains a very interesting series of investigations, which have for their aim to determine whether the nervous system has any direct control over the organic functions of parts. When a nerve is divided, the effects which result may arise from two causes, either directly from the withdrawal of nervous influence, or from the state of paralysis in which the part is left. Now, in order to find out how far the former is of any influence, it is necessary, in the first place, to eliminate the latter. In these experiments then (which were made on frogs), one of the legs was the part operated on, and after the entire nerves were cut on one side, both limbs, as well as to a certain extent the body, were fixed with plaster of Paris, so that motion was hindered on both sides throughout the experiment. The primary results of the division of the nerves was a temporary hyperæmia, with, of course, loss of sensation and motion. Of the secondary changes, emaciation is the first referred to. After careful measurements, both before and during the experiments, it is concluded that only after a considerable time the leg became thinner, and the emaciation occurred in the sound leg to an equal extent, and as soon as in the other. There were certain other alterations of the tissues, such as desquamation of epithelium, &c., but these were equally present in both legs. So that it appears as if the nutrition of a part is quite independent of its innervation, and the atrophic conditions which result after the division of nerves are produced by the forced rest in which the parts are placed. The question whether irritation of the nerves is capable of producing inflammation is also considered, and it was found that neither acute irritation (produced by sticking needles into the nerves), nor continuous (by inserting foreign bodies among the nerve fibres), produced any change on the limbs operated on, as compared with the other. The results were precisely similar in respect to pathological processes. If after the nerves of one leg had been cut, a portion of the skin was removed from both, healing took place equally well and speedily on both sides. Further, the muscles were found to preserve their electro-motor irritability even longer on the side on which a piece of the nerve had been cut out.

V. Organisms in the Blood in Disease (*Reiss*).—The author, on examining the blood of patients in acute diseases, such as typhus and scarlet fever, found numerous minute granules. Seeing them at first in such diseases, he thought they were probably fungoid in their nature; but, as he afterwards found them in cancer, phthisis, and emaciating diseases, and moreover observed that they are most abundant in the later stages of even the specific fevers, he concluded that their nature is different. He thinks that, in all probability, they are the products of the disintegration of the white blood corpuscles, and he would consequently name them disintegration-corpuscles.

PART III.

CONTENTS.—I. The pelvic bones of the manatus of Surinam, by Dr Ferd. Krauss, Stuttgart (Plate IX. and X.) II. On the excretion of uric acid in a case of Diabetes mellitus, by Dr E. Kulz. III. Overplus of the nipples, by Dr Max Bartels (Plate XI.) IV. De nervo phrenico, by Anton Spedl, Vienna. V. Contribution on the architecture of the bones, by Dr H. Wolfermann, Bern (Plate XII.) VI. Physiological studies on the action of flesh-juice, flesh-extract, potash salts, and kreatinin, by Dr Bogosslovsky.

V. **The Architecture of the Bones** (*Wolfermann*).—We have had already occasion in these pages to abstract a paper on the internal architecture of bones. (See this *Journal*, November, 1870, p. 127). In the present communication, the results of a full examination of all the bones in the human body, and many in those of animals are given, with a view to determine the architectural arrangement of the bony lamellæ of the spongy bony tissue. It is found that, in all, these lamellæ have perfectly definite and fixed directions, and that these directions are mathematically arranged so as to meet the forces to which the bones are liable. In corresponding situations these lamellæ have similar directions. The author does not enter at large, as Wolff does, into the question of the growth of bone in relation to the architecture, but is inclined to coincide in the view generally adopted, that bone grows by apposition of lamellæ, by the periosteum, and simultaneous absorption internally by the medulla. He considers that a recent paper of Kölliker's "On the distribution and function of the many-nucleated cells of bone and teeth," is of importance in this question, and thinks that, at any rate, it is rather one to be decided by histology.

VI. This paper is not completed in the present number, and is, therefore, reserved for abstraction, along with its conclusion, in our next issue.

TRANSACTIONS OF

The Medico-Chirurgical Society.

SESSION 1872-73.

FIFTH MEETING, 17th January, 1873.—Dr Scott Orr, President, in the Chair.

Mr John Campbell, L.F.P.S.G., and L.R.C.P.E., Partick; Dr T. J. F. Messer, Helensburgh; Mr James Findlater, L.R.C.P.E., and L.R.C.S.E., Glasgow; and Mr James Craig, M.B., C.M., Partick, were admitted ordinary members.

Dr Alex. Patterson read

"NOTES OF FIVE WEEKS' PRACTICE OF SURGERY IN THE GLASGOW ROYAL INFIRMARY,"

which will be found at page 183 of the February No. of this *Journal*.

Dr Lyon thought the society greatly indebted to Dr Patterson for his careful report of so many important cases. He could not, however, admit that the treatment by carbolic acid was so pre-eminently efficacious as the result of those cases appeared to show. He believed that that method, like other modes, was sometimes successful and sometimes not, and that

Dr Patterson's great care in carrying out his treatment was probably the most important feature in his success.

Dr Macleod said that in his temporary absence from the hospital Dr Patterson had charge of his patients, and he could testify that he exhibited an amount of skill and surgical ability which could be looked for only in surgeons of extended and varied experience. With regard to the antiseptic system of treatment of wounds, he was quite at one with Dr Patterson as to the eminent value of that method. It had, however, one drawback: it made greater demands on time than any other system; and this, especially in a hospital, was a matter of some importance. In regard to compound fractures, it was rare, indeed, that the treatment did not succeed; and he well remembered the time when a successful result in compound fractures was something exceptional and remarkable. He had seen the most unpromising cases doing well under antiseptic treatment. For example, he had at present a patient about to be dismissed, who had a compound fracture of the thigh, and the condyles split into the knee joint. He was treated antiseptically; there was no constitutional disturbance; and, but for his own act in injuring himself, and setting up erysipelas, there would have been no check in the progress towards recovery. In another, a train had gone over the patient's leg, smashing both the tibia and the fibula into little bits, and tearing off the soft parts. This case also recovered under antiseptic treatment, though it was 15 months before he was well. To the antiseptic system of treatment he, therefore, gave his emphatic adhesion, subject only to the qualification which he had mentioned. Another point to which he would advert was connected with strangulated hernia, and that was the necessity of giving *early* attention to such cases. Not long ago a case was admitted in which strangulation had existed for *ten* days. A medical man had given a dose of salts and senna, and the person on admission was in a moribund state. He deprecated strongly the practice of losing precious time by trying, in the first instance, the effect of medicines, so that when the case came into the hands of the surgeon it was almost hopeless. Dr Patterson had advised that in the first instance the taxis should be tried under chloroform. His own experience was that if they saw the case *early* the taxis (of course, under chloroform, no surgeon was justified in employing it otherwise) was usually successful; and that the danger of operation was in exact proportion to the length of time which had elapsed before the operation. In femoral hernia, which was the most dangerous, it was preferable not to open the sac, if possible. Far less serious results arise from this almost subcutaneous operation than if the sac was opened.

Dr Morton had, some few years ago, made a comparative trial of several modes of surgical treatment, including the so-called antiseptic system. He had tried irrigation, carbolic acid putty, putty without carbolic acid, carbolic acid with oil, oil without carbolic acid, and a number of other medicaments. The result of this comparative trial—the only one, by the way, which he had yet heard of having been made—was to point, not to carbolic acid, but to oil, as being the most successful surgical application. He was quite ready to admit that this result might be accidental, but at all events he had quite satisfied himself that carbolic acid was in no way a panacea in the treatment of surgical cases, and that, as an application, it was not superior, and probably not equal, to some others. There was a peculiarity about the antiseptic system which might lead to its foundations being sapped from the scientific side. Its advocates, and notably Mr Lister himself, strongly insisted on the acceptance, not only of the practice, but also of the theory on which the practice was based. It was only by receiving the principle, they were told, that they could fully carry out the

practice. Now, belief in the theory might no doubt lead to greater care, and therefore greater success in the practice; but their resolution to stand by the principle—*i.e.*, the germ theory—rendered the antiseptic treatment liable to assault, not only from the practical, but, as already stated, from the scientific side. He did not think that the objection of Dr Macleod, in regard to the time this system required, had any validity. To sacrifice lives because it would take extra time to save them, would be quite inexcusable. It should never be forgotten, in estimating the value of any system of treatment—and he would prove this fact in the younger members present—that, as a rule, the cases to which the surgeon paid most attention were the most successful. In a correspondence he had with Mr Holmes, that surgeon had mentioned to him that, since he had adopted the plan of attending to the important cases himself, his success had been much greater. This was not intended at all as a reflection on the dressers; the principle had a much wider application in the business of life, as every successful man could testify. As a surgeon in the Royal Infirmary who did not adopt the antiseptic system, he might mention the results of his own treatment of cases of compound fractures for the last two years. In the former of these years *all* the compound fracture cases got well, and in the latter year, they all succeeded but one. This exceptional case did not die of pyæmia in the ordinary sense, but of a condition which they saw much more frequently some 25 years ago, *viz.*, phlebitis, inflammation of the veins, with pus in the joints. There was one question he would like to put. Dr Patterson had mentioned that he cut the sac in a case of femoral hernia, close up to the crural ring, in order that the cicatrix might prevent the return of the protrusion. Now, had Dr Patterson, or any one present, seen a case in which protrusion had taken place after operation? He did not remember of having seen such a case. He agreed with Dr Patterson in regard to propriety of amputating in the case of disease of the *os calcis*.

Dr Maclean asked if any of the surgeons had utilized the freezing power of ether spray in the reduction of hernia? With regard to Dr Macleod's complaint about medical men not sending cases of strangulated hernia earlier to the hospital, the real explanation was not the ignorance of the general practitioner, but the almost invincible repugnance of the patients of the working-class to enter the Infirmary. He coincided with Dr Morton in his estimate of the antiseptic treatment.

After some remarks from *Dr Graham*, Paisley, *Dr Patterson* in reply, remarked that his experience had led him to the conviction that the antiseptic system was more successful than any other plan of treatment at present in use. If great care were taken in details, they were almost certain of success with it, and the failures could be accounted for. Of course other articles of the *materia-medica* might be found to be better antiseptics than carbolic acid, which was not of the essence of the system. With regard to the allegation that it took more time than other modes of treatment, he denied that *in toto*. They required to dress the wound at first once a day, then every fourth day, or once a week; and he did not admit that the total time occupied in attending to a case throughout was so great as under other treatment. With reference to the case of compound dislocation at the ankle joint, he might mention that this was one of the most fatal injuries in surgery. Syme had, he believed, 14 cases in succession, which all died.

SIXTH MEETING.—Dr Scott Orr, President, in the chair.

Mr David M'Vail, L.R.C.P., Edinburgh, and L.F.P.S., Dr James Arnott, Bombay, and Dr Gemmel, Dunoon, were admitted ordinary members.

Dr Hector Cameron read a paper

“ON COLO-PUNCTURE,”

which will be found at page 289, of the present number.

Dr Lyon had lately a case in which he had tried the operation. Three punctures were made, but a considerable quantity of fecal matter had escaped into the abdominal cavity. He used a small trochar; the result was unsuccessful, and, in view of his experience in that case, he would be very chary in repeating the operation. In nearly all cases a tube could be introduced per rectum, and this could be done with much less risk than puncturing the colon. It would not do in all cases to depend on the pressure effected by the distension to prevent the escape of the fluid. In his case, he might mention that he had formed his opinion from inspection after death, and he admitted that it was possible that the fluid, which was not in any large quantity, may have escaped after death.

Dr Andrew Buchanan had come to hear *Dr Cameron's* paper, as the subject was one in which he had long taken much interest. *Dr Cameron* had very properly divided the cases of intestinal flatus into two classes, the first being those in which there is inflammation, and in most of these the operation was a very doubtful matter. In cases of tympanites accompanying, say, puerperal peritonitis, they had no means of saving the patient's life. Puncture would be of no avail, and the operator would only incur the odium of the patient's friends, though, of course, he should not from this cause alone shrink from the task, provided he believed there was a possibility of doing good. *Dr Cameron's* case was one of chronic inflammation, and his success proved that in some inflammatory cases it would be a nice question whether to operate or not. In many of the cases where mechanical obstruction existed, the operation was more hopeful. He has seen half-a-dozen instances since 1819 of punctures in these cases. In that year he saw the first case in Edinburgh Infirmary; the abdomen was of extraordinary size. They could see nothing but four strips of gut, having all the colours of the rainbow. Mortification had set in before death. It was a case to strike the eye of an inexperienced student, and he had never forgotten it. After he came to Glasgow, he saw several other cases, all, he believed, arising from the same cause, a peculiar malformation of colon. It always occurred to him that if they could get rid of the wind, there would be a hope of the symptoms being gradually mitigated. The plan which promised him the greatest prospect of success was to penetrate the colon with an aneurism needle, threaded with wire, the needle being drawn through the opposite side, leaving the wire forming a loop in the colon. In the case in which he tried this plan, the gas squirted out at both openings at the side of the wire. The operation, however, was performed when the woman was nearly *in articulo mortis*, and she succumbed. But this method of puncture seemed to him to have a better chance of success than that by the trochar. It had this advantage, that by drawing the wire a bit further every day, they allowed the escape of the gas, and avoided the necessity of repeated puncture. The wire would not injure the bowel. With regard to the introduction of a tube per rectum, he had been unable in one case to get an ordinary tube past the top of the sacrum. To obviate this difficulty he got a leaden rectum made—that is, a leaden tube of the shape of the colon. The late *Dr Laurie* assisted him in introducing this tube. He got it fairly up beyond the resisting fold of the colon, when instantly there was a rush of feces, and then a rush of gas. Before night, however, the tympanitis was as bad as ever, she was seized with peritonitis, and died in three days. The place for puncturing was just outside of

the nectus muscle. To puncture further down would be most objectionable, because there would probably be an extrusion of fæces.

Dr Fergus had seen one of the cases referred to by *Dr Buchanan*, and he could testify to the great relief which followed the discharge of the flatus.

Dr Eben. Watson sympathized with *Dr Cameron* in regard to his remark about the difficulty of getting a trocar exactly fitting the cannula. All surgeons, perhaps, had been similarly annoyed. With regard to the operation he thought that there would be little danger of the escape of feculent matter into the peritoneum, on account of the almost immediate closing of the puncture from the contraction of the muscular coat of the bowel, and the protruding of its mucous lining. Even in much larger wounds there had not been found any escape of the contents. But, in regard to the surgical aspect of the case generally, he had great doubts of the propriety of puncture in inflammatory cases. He had no recollection of hearing of a recovery after puncture in a case similar to that of *Dr Cameron*; and he was sure that the cases recorded must be few in number. The medical aspect of the affection should be kept in view. In this respect these cases essentially differed from the other class of cases—those of mechanical obstruction of the lower part of the gut, in which puncture may be the only available means of treatment. In inflammatory cases the treatment should be directed not to the affording of a mere temporary relief to the patient, but to the removal of the cause of the distension, though to reach this might be a matter of great difficulty. The mere puncture of the bowel could not, at all events, effect this; and, therefore, being in such cases only a temporary expedient, it was not to be looked on as of much importance. Puncture was an easier means of relief than the tube, and, perhaps, as secure; but in cases of the kind in which *Dr Cameron's* operation was performed, neither puncture nor the tube could be looked on as a means to a cure, but only to a temporary relief.

Dr Hugh Thomson said that in such an affection even the affording of temporary relief may be a matter of great importance, as this may gain time, and, as in the present case, lead to permanent relief. It was often of great consequence to allow time for the recuperative forces of nature to come into play. There was no doubt some danger attending the operation, and, in the event of an unfavourable result, some odium might attach to the operator; but this was also the case in such operations as that of opening the trachea in croup, which, indeed, bore some analogy to the present operation, in so far as it also was of service as a temporary expedient which sometimes led to a cure. He thought *Dr Buchanan's* mode of colo-puncture an admirable one, as the risk from the escape of fæces was less, and it was necessary to puncture only once.

Dr McLean said that one important fact to be borne in mind was that, in distension of the bowel from flatus, there existed paralysis of the coats of the bowel. The coats of the bowel were deprived of their power to expel the flatus as it collected. Now, he did not see that in face of this fact, colo-puncture could do anything but permit the escape of the gas for the occasion; but it would again collect, and recourse would again require to be had to the operation. This was what actually happened in *Dr Cameron's* case. The same objection equally applied to the tube. Both plans could only be looked on as temporary expedients.

Dr Donaldson said that, in performing operations for hydrocele abroad, under circumstances in which he could not procure at the time proper instruments, he was obliged, in order to get the puncturing instrument properly through the coverings of the swelling, first to make an incision in the integuments.

Dr Cameron said that, as far as he could gather from *Dr Lyon's* remarks, his theory in regard to the tube being always available as a means of treatment did not tally with his practice, for in the case of colo-puncture to which he had referred, he made no mention of having tried the tube. *Dr Cameron* could not concede that the tube was practically available in all cases. In not a few instances he was certain that the operation would not be submitted to by the patient. In the case which he had detailed, it would have been impossible to catheterize the patient per anum for several successive days. In *Dr Lyon's* case fæces had come through the tube, and he was satisfied that unless the precautions to which he had adverted in his paper were taken, fæces would make way into the peritoneum. The possibility of puncturing the colon without any bad effect, had been established by the experience of a number of cases which would be found in the *British Medical Journal* for October and November, 1871. He thought *Dr Buchanan's* plan of colo-puncture was a good one. They were all aware of that gentleman's great ingenuity, and he was much gratified at the interest his old teacher had manifested in his paper. He might mention that he had read the paper not to advocate this particular system of treatment, but chiefly to elicit the opinion of the members. He thought that, at all events, it would be generally admitted that in a few cases in which a fatal result was otherwise inevitable, it might be proper to have recourse to the operation. The fact of one such case having been followed by recovery appeared thus far to justify the operation.

SEVENTH MEETING, 7th March, 1873.—*Dr Fergus*, Vice-President, in the chair.

Dr Charteris read a paper on the

“USE OF MINERAL WATERS.”

After some remarks on the history of the use of mineral waters, *Dr Charteris* discussed the question,—For what class of diseases then are mineral waters useful? The answer to this was, the chronic and subacute diseases. They are of little value—indeed, they are generally positively injurious in all acute affections of the chest or heart. Whenever there is considerable structural change of important organs, or where the composition of the blood has become much altered, their use must be distinctly forbidden. On this point all authorities seem to agree. Hence the patient, from whatever other disease he suffers, who by family history or otherwise evinces a phthisical predisposition, must on no account be permitted to proceed to a mineral spa.

Dr Charteris gave the case of M. L., æt. 22, who, in the course of her marriage tour, went to Homburg. In the mornings she was in the habit of going to the wells, and drinking, without taking any advice on the subject, the Elizabethan water. She continued to do this for some days, when suddenly she was attacked with severe hæmoptysis, which so weakened and exhausted her, that she was obliged, during the remainder of her visit, to consider herself an invalid, and was forced to remain indoors. She was of a phthisical family, but previous to her coming to Homburg, she had evinced no symptoms of chest disease. It would be impossible to say in what way the ingredients contained in the Spa stirred up the latent tuber-

cular diathesis to such an acute development, but that such was the case I can testify, and the experience of physicians resident there all coincide in warning phthisical patients from an otherwise charming spa.

Having thus indicated for what diseases mineral waters are useful, the question naturally arises where the patient should be sent?

Many classifications of mineral springs have been attempted. For all practical purposes they may be divided into alkaline springs (with their subdivisions of alkaline-acidulous and alkaline-saline), simple muriated waters, bitter waters, chalybeate, and sulphurous waters.

(1.) The thermal springs of Vichy may be taken as representative of alkaline springs. These contain in every 16 ounces, not less than 37·50 grains of carbonate of soda. The waters are useful in jaundice depending on the presence of gallstones, and especially in gout, if dyspeptic symptoms are very prominent. They also facilitate the passage of renal calculi, and are markedly efficacious in curing gravel, and arresting the progress of diabetes.

(2.) Of the muriated alkaline-acidulous springs, where, in addition to the bicarbonate of soda there is also chloride of sodium, Ems may be taken for example. Here, in 16 ounces, there are of the former salt 14·8 grains, of the latter 7. There is also an abundant supply of carbonic acid (nearly 19 cubic inches being contained in the 16 ounces). Ems, from its sheltered situation, is especially suited for cases of clergyman's sore throat, bronchial and laryngeal catarrh. By means of the Buberquelle uterus douche, it possesses also the great reputation of curing sterility, due to what is termed chronic parenchymatous metritis. The uterus in this case is hard and firm to the touch. The vaginal canal is hyperæmic, the cervix uteri is filled with mucus, and the uterus secretes a considerable quantity of mucus. In all anomalies of menstruation, in hysteria, leucorrhœa, gravel, &c., the waters of Ems may be advantageously employed.

(3.) Of the alkaline-saline springs, Marienbad and Carlsbad may be taken as types. Here sulphate of soda, bicarbonate of soda, and chloride of sodium, are contained in solution. They are particularly suited for corpulent persons, for those suffering from habitual constipation, enlarged liver, &c.

(4.) Of the bitter waters, Frederickshall, Pulna, Leamington, and Cheltenham are well known examples. They act chiefly through the large quantity of sulphate of magnesia contained in solution, the waters of Frederickshall containing as much as 40 grains to the ounce. They are useful in cases of habitual constipation, abdominal plethora, &c.

(5.) The muriated waters, or waters whose chief ingredient is chloride of sodium, are illustrated by Wiesbaden (thermal), Kissengen, and Homburg (cold), these springs are especially famous for rheumatism and various forms of dyspepsia.

(6.) Of the chalybeates, where iron is united with carbonic acid and with few solid ingredients, Schwalbach, Spa, and St Moritz, are particularly

remarkable. The quantity of iron varies from 0.3 grains to 0.8 in 16 ounces.

(7.) Of sulphurous waters Aix-la-Chapelle is best known (thermal). The Kaiserquelle of Aix-la-Chapelle is principally employed in skin affections which are due to syphilis, though the waters are also taken, and with advantage, in prurigo, acne, and sycosis. The theory held by Dr Wetzlar, a well-known physician at Aix-la-Chapelle, as to their use in syphilis, is ingenious, and possibly true. He asserts that syphilis may be latent in the system, and, if so, although ostensibly cured, a fortnight's use of the waters and baths will bring out the constitutional phenomena. Hence, for those who have had syphilis, and who may wish to ascertain, previous to matrimony, if they are entirely cured, Aix-la-Chapelle affords a very crucial test. If no syphilitic symptoms appear, the man is considered cured; if they do, he is submitted to the action of the waters; but this is accompanied with mercurial innunction. One thing is certain, that much more mercury can be introduced into the system when the Aix-la-Chapelle waters are also employed, than could with safety be given at home.

That the situation and the climate materially influence the effect of mineral waters few venture to dispute. So important, in my opinion, is their influence, that I cannot bring myself to believe that artificial mineral waters are of much benefit, however carefully they may be prepared, and I am somewhat dubious as to the advantage to be derived from waters which have been bottled up and exported before they are taken. Experience shows that the waters should be drunk as they well up fresh and bubbling from their native source. The intimate union subsisting among their many constituents is then in no way impaired either by climatic or atmospheric change. As illustrating how the situation of the Spa and its surroundings, wonderfully assist in the effect produced, let me refer to the well-known Nassau Spas.

Wiesbaden has long been famous for its efficacy in chronic rheumatism. Situated in a sheltered valley at the foot of Taunus mountains, eight leagues from Frankfort, it is protected on every side from varying atmospheric change. The mean temperature during winter is 40° Fah. Snow rarely lies on the ground more than a few hours. Only thrice during the present century has there been anything like a severe winter. The air feels dry and warm in winter, as well as summer. Thus, we see, we have a place admirably suited for rheumatic patients.

The other Spa to which I shall allude is Schwalbach.

Schwalbach is distant from Wiesbaden only ten miles, but is situated on the northern slopes of the Taunus mountains. It lies 909 feet above the sea level, nearly thrice as high as Wiesbaden. The air is keen and bracing—somewhat like Moffat in this country—indeed, in the evenings it is positively cold. Thus, within the short compass of a few miles, we come to a Spa where the climatic range is markedly different from the one last described. The springs are also of totally different composition and

character. Wiesbaden is thermal. Schwalbach cold, the temperature being from 48° to 50° Fah. Wiesbaden belongs to the muriated class of waters. Schwalbach, on the other hand, is chalybeate. The carbonate of iron, with few other solid constituents, being intimately associated with carbonic acid. Pale anæmic patients are ordered to Schwalbach, and Dr Geuth, the principal physician at the place, has related very carefully the many cases which have come under his observation, and has shown how in some the proportion of red globules was nearly doubled by the use of the waters. The keen bracing air enables the patient to take plenty of exercise, and the iron, assimilated to the system, works, in the course of a few weeks, a wonderful change in the constitution. The great difficulty experienced at home in prescribing iron is this, that it is not absorbed in ordinary pharmaceutical preparations, but passes away by the fæces. Combined, however, in the form of the carbonate of iron with carbonic acid, as it is in the Schwalbach waters, it is readily absorbed by the system. To effect this most beneficial change the intimate union subsisting between the iron and the carbonic acid must not be interfered with by any bottling process. At the same time, the atmosphere must be keen and bracing. Hence, Schwalbach, from its elevation and exposed situation, seems formed by nature to facilitate nature's chalybeate remedy. All chalybeate springs of any importance are situated at a very considerable altitude above the sea level. Thus we have Spa, 1000 feet above the sea level; Schwalbach, 909; Pymont, 404; and St Moritz, in Switzerland, 5000. Indeed, my own opinion is, that artificial or bottled natural mineral water should be taken in some place where the natural situation compares, as nearly as possible, with the natural position of the Spa, say at Moffat or Braemar.

Mr John Reid was somewhat sceptical in regard to a good deal of what was often advanced about the curative virtues of Spas. Dr Charteris, however, had not taken an extreme view of his subject; he had admitted that in the case of organic diseases mineral waters could have no effect. That some waters had tonic properties, that others acted as aperients, some as diuretics, and others on the skin, was a statement that indicated clearly enough the class of cases in which they might be used with advantage. But in regard to some of the therapeutical applications suggested by Dr Charteris, he had considerable doubt. How, for example, a mineral water could have any specific efficacy in curing rheumatism—an inflammatory affection (even in chronic cases there was more or less inflammation) he could not see. He was even a little sceptical about the effects sometimes attributed to mineral waters. It was more probable, for instance, that the young lady, who, in Dr Charteris' opinion, had phthisis developed by drinking the Homburg waters, had been on the verge of phthisis at the time of her visit. Then, in regard to gout, the change in the mode of life, and the surrounding circumstances, had probably more to do with the effect than the imbibition of the waters. In fact there was often a great deal of careless reasoning on the subject. There was no attempt made to isolate their independent effects from those attributable to the altered hygienic surroundings of the patient. He did not see, if the waters were themselves therapeutical, why the artificial waters, or the

real waters as sent to a distance in bottles, should not be efficacious; and the allegation that they were not so, suggested a strong doubt of their extensive curative powers.

Dr Lyon also felt a good deal of doubt as to the effect of the waters themselves. He had visited some of them as a patient, and had often sent patients to them; and, on the whole, he was inclined to attribute what good a residence at a Spa could effect, rather to the adjuncts of the treatment, than to the waters. He had sent a patient lately to Buxton for rheumatism; but there had been only a little mitigation of the affection, even after a considerable period. He concurred with *Dr Reid's* view as to the possibility of having artificial waters at home as efficacious as those of the Spa.

Dr Joseph Coats said that, if he understood *Dr Charteris* aright, he had attempted a philosophical explanation of the superior efficacy of Spa waters. He had told them that these waters had been provided by nature, and that nature had not only provided the waters, but had obligingly indicated the necessary climate and other conditions of their use; that, for example, chalybeate springs were found at high altitudes, and in this way there was a sort of geological formation for the treatment of certain diseases. He did not doubt his conclusion in regard to the superior efficacy of natural springs as compared with imitations, but he was somewhat doubtful of the explanation.

Dr Steven said that the well known fact of their patients frequently repairing to the mineral waters, and being benefited, though they had not drank the waters at all, or had drank them in quantities much smaller than that required for the manifestation of their characteristic properties, clearly showed that the efficacy of a residence at these places was chiefly due to the change of circumstances, and not to the waters. The fact, also, of its being admittedly only chronic diseases which were benefited, was in itself enough to suggest great caution in drawing conclusions. In a large number of these diseases, the natural tendency was to recover. Such a disease, for example, as chorea, might be said to be curable under any treatment—and they were aware of the great variety of treatment adopted. He coincided with *Mr Reid* in the opinion that probably, in the case of the young lady referred to by *Dr Charteris*, the Homburg waters had nothing to do with the development of phthisis. He was also very doubtful of the theory in regard to the development of syphilis propounded by the physician at Aix-la-Chapelle. His narrative of the case was somewhat suggestive of his preserving it in a condition requiring treatment. *Dr Charteris* has mentioned, as one of the diseases likely to be benefited by mineral waters, the jaundice depending on gall stones. Now, he would submit that the jaundice, depending on this cause, would continue as long as the exciting cause, and would stop when that cause was removed, and no mineral waters could remove the jaundice till the cause of it had ceased to operate.

Dr Fergus said that he for one had a strong belief in the power of mineral waters *per se*. No doubt the concomitant circumstances of treatment—the necessity of following the advice tendered to Falstaff to “purge and live cleanly”—had a great effect; but these did not account for all the results produced by residence at a Spa. He had observed often, however, that one visit to a mineral watering-place was often ineffective, but that by going repeatedly the desired effect was at last produced. He complained, however, that the physicians of these Spas frequently got into a routine habit of prescribing. Instead of investigating the nature of each case, they not infrequently prescribed on the compendious principle of *Dr Gregory*, who advised a roomful of patients who met him at Aberdeen

on his way to the Highlands, to go to the druggist and purchase Gregory's mixture!

Dr Charteris said that, before he had visited the Continental watering places, he was equally sceptical with some of the members who had spoken; but it was difficult to resist the evidence of beneficial results which such a visit had brought before him. He had been as moderate in his statements as he could, and he was perfectly aware that in estimating the results of this treatment, a great deal of the good done must be credited to climatic, hygienic, and other causes.

EIGHTH MEETING, 4th April, 1873.—*Dr Scott Orr*, President, in the chair.

Mr Murdoch Cameron, M.B., C.M., Glasgow, was admitted an ordinary member.

Dr Morton read a paper

“ON SOME CASES OF STRANGULATED HERNIA.”

The President said that the cases which *Dr Morton* narrated had been of a very varied character, and contained many points of interest to the surgeon. One practical lesson which was brought out by the paper was the great danger of delay in these cases.

Dr Lyon had anticipated that, in regard to this diseased condition, the essayist would have given them something new; but in this he must confess that he had been disappointed. No doubt the cases which *Dr Morton* had detailed had a certain kind of interest, but they were all of a commonplace character, and presented few, if any, features of that kind which would warrant their being brought before the society.

Mr John Reid was of opinion that *Dr Lyon's* criticism was hardly deserved, as the subject was one of enduring interest from the frequency of the occurrence of strangulated hernia. The number of cases of inguinal hernia in female had struck him forcibly as *Dr Morton* was reading his paper.

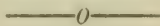
Dr Hugh Thomson did not concur in *Dr Lyon's* remarks, as some of the cases mentioned by *Dr Morton* were certainly not in the ordinary course, and from not a few of them very good practical suggestions could be drawn. From one of his cases, for example, he would draw the lesson that a very small knuckle of strangulated intestine was often more dangerous than a large one. The former was forced through a small opening, and usually very tightly constricted.

Dr Alex. Patterson denied that the paper was in any sense devoid of interest from lack of novelty. He (*Dr P.*) had operated for strangulated hernia 38 times, and there was something new in every case. The cases of *Dr Morton* in which he had felt most interest were the third case where the bowel only protruded through the internal ring, the case of artificial anus, and the case of incomplete hernia diagnosed and operated on successfully. This latter form occurred more frequently than they were apt to imagine, and was often diagnosed as enteritis, and treated wrongly.

Dr Lothian gave an account of a case of umbilical hernia in a stout gentleman 60 years of age, which had occurred in his practice. He was operated on under chloroform, but two or three hours afterwards the hernia came back and peritonitis supervened.

Dr Morton said that his friend *Dr Lyon* had become, through long practice, so perfectly familiar with this department of surgery, that it required the relation of some remarkable case, or some unheard of mode of cure, to give him anything in the way of a new sensation. The question of the

relative frequency of inguinal or femoral hernia in the female had been discussed in a paper recently published in one of the London Hospital Reports, and the writer appeared to have established a conclusion different from the opinion generally prevalent; for, on a wide basis of statistics, he had founded the induction that inguinal hernia did not prevail in the male sex to a greater extent than in the female.



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Original Articles.

I.—ANEURISM OF THE LARGER ARTERIES OF THE BRAIN, AS A
CAUSE OF CEREBRAL HEMORRHAGE.

By JOSEPH COATS, M.D., *Lecturer on Pathology in Glasgow University, and
Pathologist to Glasgow Royal Infirmary.*

It has been recently asserted by Bouchard and Charcot that, in the great majority of cases of cerebral hemorrhage in old people, the effusion of blood is due to the rupture of so-called "miliary aneurisms" in the brain substance. These aneurisms are dilatations of the smaller vessels of the brain, and are generally present in considerable numbers in the same case. In view of this statement, which is receiving confirmation from various directions, it may be well to consider the part which aneurism of the larger arteries of the brain plays in the causation of cerebral hemorrhage. The number of recorded cases of this nature is not inconsiderable, and I have myself met with two cases within a comparatively short period of time. Before entering on the more general results deducible from the recorded cases, I shall first briefly describe the two observed by myself.

CASE I.—*Aneurism of the right posterior cerebral artery. Probable limited rupture. Second extensive rupture after twelve days. Death in a few hours. Advanced disease of the aortic valves.**

* The preparation from this case will be found in the Museum of Glasgow Royal Infirmary. Series III. No. 95.

The patient, a man aged 25, was admitted to Glasgow Royal Infirmary on November 8, 1870. At the time of admission he was quite conscious, and could give a perfectly good account of his illness. He stated that, two years before, he had suffered from an attack of rheumatism, that a second attack occurred two months before admission, and the present illness had presented to him the characters of a third. The present attack came on a week before admission, and was characterised by severe pain in the head, neck, back, and knees. He had also an attack of what he describes as the nerves, and which seemed to have the characters of a convulsive seizure; in consequence of this he remained unconscious during a whole night. In addition to these symptoms there was a certain amount of cough and breathlessness, and examination of the lungs showed some moist râles. The area of dulness of the heart was considerably increased, and a murmur was observed to precede and follow the first sound (A S. and V S.). Five days after admission, and therefore about twelve days after the first seizure, a convulsive attack suddenly supervened, and proved fatal in a few hours.

On examination of the brain there was found to be a very extensive effusion of blood. The blood was present in large quantity both at the base of the brain and in the lateral ventricles, both of which, but especially the right, were distended by it. Behind the right lateral ventricle was a pretty large cavity lined by a thin membrane, and in the wall of this cavity was found what afterwards turned out to be an aneurism of the posterior cerebral artery. The aneurism was about the size of a field bean, and its walls were comparatively thick. It communicated freely with the large thin-walled cavity. The heart was found to be considerably enlarged, the enlargement involving chiefly the left ventricle. The aortic valve was almost entirely destroyed, warty projections occupying the place of the semilunar folds. Both kidneys presented cicatrices and recent embolic infarctions. The spleen weighed twenty-six ounces, but no embolic infarctions were discovered.

In this case the commencement of the illness, which proved fatal, was accompanied by a convulsive seizure which produced pretty prolonged unconsciousness. In all probability this was coincident with the formation of the large thin-walled cavity described above. The aneurism ruptured at this time, but the hemorrhage was limited, and the clot afterwards became bounded off by a thin fibrinous membrane. Taken in connection with the disease of the heart which was evidently of old standing, this case may be also of some consequence in the etiology of aneurisms. Smith, in the *Dublin Quarterly Journal*, Vol. IV, p. 446, describes a case in which an aneurism of the left middle cerebral was associated with disease of the aortic valves, and the origin of the aneurism seemed distinctly traceable to embolism of the cerebral vessel, the source of the embolus being the diseased valves. Again, Ogle, Church, Tufnell, and Holmes, all consider that embolism plays an important part in the causation of such aneurisms, the obstruction in the vessel causing increased pressure and consequent dilation behind the embolus. In the present case it will be noted that old and recent embolic conditions existed in the kidneys.

CASE II.—*Aneurism of right middle cerebral. Rupture and death in thirty hours.* P. M'G., a bottle-maker, aged 28, was admitted to Glasgow Royal Infirmary on 16th January, 1872. He was said to have been subject to falling sickness in early life, but has been free from it since boyhood. On the morning of the day on which he was admitted, he left home about eleven A.M. in his usual state of health. At one o'clock he was picked up in the street insensible. When admitted about six P.M. he was only partially unconscious, answering questions in a slow and bewildered manner, and he was restless and fidgety. There was no account given of anything like convulsions, and nothing of the kind had been visible since admission. In the course of the night he seemed to improve somewhat, he took his medicine easily, and drank some milk after it. About seven next morning, however, coma began to set in, which gradually became complete till he died at 8.45 P.M.

On *post-mortem* examination, a very extensive effusion of blood was found. On the surface of the brain the blood was most abundant at the base, where it covered the vessels of the circle of Willis; but it extended into the fissure of Sylvius on both sides, and even up on to the hemispheres, being more abundant, however, on the right than the left. It was everywhere beneath the arachnoid membrane. Both lateral ventricles were filled with blood-clot, but the right was more distended than the left, the septum being bulged towards the latter side. Just outside the right ventricle there was a large ragged cavity filled with clot, and communicating with the lateral ventricle by a tear in the corpus striatum. This cavity, which was larger than the ventricle itself, was excavated partly in the white substance of the brain, and partly in the corpus striatum, and it communicated with the fissure of Sylvius near the island of Reil as well as with the lateral ventricle. On tracing the middle cerebral artery in the fissure of Sylvius, an aneurism of about the size of a horse-bean was found, situated on one of the primary branches of the vessel just at the point of bifurcation, in fact the proximate wall of the other branch was in part involved. The aneurism is somewhat fusiform in shape, but bulges rather more towards the other vessel than away from it. In the wall of the aneurism a distinct circular aperture, with everted edges and about an eighth of an inch in diameter, was discovered. On tracing the vessel beyond the aneurism, it was found to pass into the large cavity torn in the brain substance, in which it was almost isolated. In the neighbourhood of the cavity the brain substance was much injected, and points of ecchymosis were visible. The other organs of the body were perfectly normal, with the exception of the lungs, which presented hypostatic engorgement and œdema.

It now remains to consider the subject in some of its more general aspects. I have collected from various sources 87 cases of aneurism of the larger cerebral arteries, and propose to use these as the basis of a general view of the subject.

In respect to *age*, the cases just recorded form no excep-

tion in the earliness of the age at which they occurred. It is well worthy of note, in relation to the diagnosis of such cases, that cerebral hemorrhage, as a result of aneurisms of the larger vessels, occurs in general at a much earlier age than cerebral hemorrhage as a whole. According to Rochoux and Durand Fardel,* cerebral hemorrhage almost never occurs before 20, is rare up to 40, but after that age it becomes frequent. Taking the cases before 80, and dividing them according to their ages, it is seen that only $\frac{1}{160}$ th occur under 20, one-seventh under 40, and six-sevenths from 40 to 80. Contrast with this the following note of the ages in the cases collected. Of the 87 cases, there were 79 in which the age was noted, and the numbers were as follows:—

Age of 79 recorded cases.

| | | | | | | | |
|---------|-----|-----|----|----------|-----|-----|----|
| 1 to 10 | ... | ... | 0 | 41 to 50 | ... | ... | 12 |
| 11 " 20 | ... | ... | 14 | 51 " 60 | ... | ... | 18 |
| 21 " 30 | ... | ... | 12 | 61 " 70 | ... | ... | 5 |
| 31 " 40 | ... | ... | 16 | 71 " 80 | ... | ... | 2 |
| | | | | 79 | | | |

The average age in these 79 cases was 40, and this average is perhaps made higher than it should be by the fact that there were one or two cases of very advanced years. The truth is perhaps better brought out when it is stated that of the 79 cases, 42 were between the ages of 10 and 40, and 37 between 41 and 80. Or the contrast to the ages given by Durand Fardel as those of cerebral hemorrhage in general is very prominent when it is observed that nearly one-sixth of the cases occurred before 20, that more than half were under 40, and only five-elevenths above that age. These facts closely agree with the results of certain other writers. Thos. Brinton† gives as the average of 40 recorded cases, 42 years, and he states that two-thirds of the cases occurred before 50. Again, Lebert‡ in 76 cases in which the age was recorded found 13 up to 20, 22 between 20 and 40, and 32 from 40 to 60.

If, on the other hand, we compare the ages of these cases

* *Traité clinique et pratique des Maladies des Vieillards.*

† *Pathological Transactions*, 1850-1. P. 47.

‡ *Ueber die Aneurismen der Hirnarterien.* Berlin Klin. Wochenschr. 1866. III. Nos. 20, 22, 24, 28, 34, 35, 40, 42.

with the ages at which aneurisms in general occur, we shall find considerable correspondence. Lisfranc gives as follows the ages of 120 cases, and Crisp* of 505 cases:—

| <i>Age of Aneurisms in general (Lisfranc.)</i> | | | | <i>Age of Aneurisms in general (Crisp.)</i> | | | |
|--|-----|-----|-----|---|-----|-----|-----|
| At 13 | ... | ... | 1 | Under 10 | ... | ... | 1 |
| 10 to 20 | ... | ... | 3 | 10 to 19 | ... | ... | 5 |
| 20 " 30 | ... | ... | 17 | 20 " 29 | ... | ... | 71 |
| 30 " 40 | ... | ... | 39 | 30 " 39 | ... | ... | 198 |
| 40 " 50 | ... | ... | 37 | 40 " 49 | ... | ... | 129 |
| 50 " 60 | ... | ... | 17 | 50 " 59 | ... | ... | 65 |
| 60 " 70 | ... | ... | 3 | 60 " 69 | ... | ... | 25 |
| 70 " 80 | ... | ... | 3 | 70 " 79 | ... | ... | 8 |
| | | | | 80 and above | ... | ... | 3 |
| | | | 120 | | | | 505 |

Even as compared with aneurisms in general, however, the ages of the cases of cerebral aneurism must be looked on as exceptionally low, at least in this respect, that cases of the latter seem to occur much more frequently under 20 than those of the former. Thus of all Lisfranc's and Crisp's cases, only 10 are stated to be under 20 years of age, and it must be remembered that their numbers much exceed mine. Whereas, of these 79 cases of cerebral aneurism, no less than 14 were under 20. The youngest case is one by Church of a boy of 13 (see note at end, No. 18). There were three cases at 14 (Nos. 25, 46, and 75), and one at 15 (No. 27).

Occurrence of Hemorrhage from Rupture.—In all the cases collected, except one, the fact was noted of rupture of the aneurism or the absence of rupture. There were 62 in which rupture had occurred, and 24 in which it had not. Rupture had thus occurred in about three-fourths of the cases. This proportion, however, is high; Lebert found it to be three-fifths in his cases, and Brinton only three-eighths. In several there were, as in one of the cases recorded at the beginning of this paper, several apoplectic attacks before that which proved fatal; but as a general rule, there was but the one, and it was fatal within a very short period of time. Many of the cases were persons who

* A treatise on the structure, diseases, and injuries of the blood-vessels. London, 1847.

had been previously in perfect health, and were struck down very suddenly. Lebert remarks that, as might be expected from the nature of the case, death in these cases is, as a rule, more rapid than in cases of cerebral hemorrhage in general. In general, cerebral hemorrhage is only fatal in about three days, but among his cases 17 died within 12 hours.

In regard to the *symptoms* and *signs* of intracranial aneurism during life, and before the violent seizure which usually accompanies rupture, it may in general be stated that these are by no means characteristic. In one case, recorded by Coe (No. 62), an aneurism of the left internal carotid in the cavernous sinus was diagnosed during life and cured by ligature. The facts on which the diagnosis was founded were chiefly internal strabismus and an arterial murmur. In a large number of the cases there were no symptoms till the sudden apoplectic seizure, but in many there were a variety of cerebral symptoms. Perhaps the most frequent of these was pain, which was often very severe, and may have existed for a long period. In aneurisms of the basilar artery this symptom was more frequent than in others, and the pain was generally referred to the back of the head. In almost all the cases recorded in which rupture had *not* taken place, there were some prominent nervous symptoms. These were usually caused by pressure on some part of the nervous system, this pressure leading in some cases to softening and inflammation. Too much importance should not, however, be laid on this fact, because, doubtless, in most of the cases in which rupture did not occur, it would be some prominent symptoms which led to the examination of the brain and the discovery of the lesion. We cannot know how many cases of aneurism run their course without any symptoms, and without the occurrence of rupture. In four or five of the whole 87 cases there were symptoms of epilepsy existing for a time before death; in one or two there was mental derangement. In general, then, it may be stated that where we have obscure brain-symptoms, especially when these are suggestive of the presence of a tumour,

followed by a sudden apoplectic attack, then we may suspect intracranial aneurism. Or, if apoplectic symptoms should occur in a comparatively young person, either with or without previous nervous symptoms, then again the rupture of an aneurism should be suspected.

As regards the *state of the vessels* of the brain generally, no note is made in a large number of cases. In many, however, it is noted that the vessels generally were sound, and only in a very few that atheroma was present. This is almost what we would expect from the ages of the cases as noted above. It is well known that atheroma of the cerebral vessels is an almost constant occurrence in persons advanced in life, but is very infrequent in the earlier periods. "It is met with, according to Bichat, in seven individuals out of ten who die beyond the age of 60." As we shall have to return to this subject when considering the causation of intracranial aneurisms, it may be sufficient to note here that atheroma seems seldom or never to be the essential agent.

In the next place, the *vessels affected* demand some consideration. In the following table the number of cases in which the various vessels were the seat of aneurisms is noted, and the side where that is recorded. No mention is made of the side in 14 cases, and as there are 19 in which the basilar is the vessel affected, there are thus 54 remaining in which the two sides may be compared:—

Note of Vessels affected by Aneurism in 87 cases.

| Vessel. | No. of Cases. | Left. | Right. |
|---------------------------------|---------------|----------|----------|
| Internal carotid, | 12 | 5 | 3 |
| Basilar, | 19 | 0 | 0 |
| Vertebral, | 4 | 1 | 2 |
| Posterior communicating, | 4 | 2 | 1 |
| Anterior communicating, | 3 | 0 | 0 |
| Middle cerebral, | 32 | 21 | 11 |
| Posterior cerebral, | 4 | 2 | 1 |
| Anterior cerebral, | 4 | 2 | 2 |
| Anterior cerebellar, | 1 | 1 | 0 |
| In midst of pons, | 1 | 0 | 0 |
| In corpus callosum, | 1 | 0 | 0 |
| Artery of pia mater, | 1 | 0 | 0 |
| In cerebellum, | 1 | 0 | 0 |
| | <hr/> 87 | <hr/> 34 | <hr/> 20 |

If we arrange the cases according as they belong to the carotid or vertebro-basilar system, then the following will be the result:—

| <i>Branches of carotid system.</i> | | | | <i>Branches of vertebro-basilar system.</i> | | | |
|------------------------------------|-----|-----|-------|---|-----|-----|-------|
| Internal carotid, | ... | ... | 12 | Basilar, | ... | ... | 19 |
| Post. commun., | ... | ... | 4 | Post. cerebr., | ... | ... | 4 |
| Ant. commun., | ... | ... | 3 | Vertebral, | ... | ... | 4 |
| Mid. cerebr., | ... | ... | 32 | Ant. cerebellar, | ... | ... | 1 |
| Ant. cerebr., | ... | ... | 4 | | | | <hr/> |
| | | | <hr/> | | | | 28 |
| | | | 55 | | | | |

In reviewing these figures the very great preponderance of aneurisms of the middle cerebral arteries must strike us at once. There were 32 of the cases in which the aneurism was situated on this vessel. In this relation it will also be noted that the left middle cerebral was affected nearly twice as often as the right, the numbers being respectively 21 and 11. These facts are worthy of notice, especially in relation to the causation of such aneurisms. We know that embolism of the cerebral vessels occurs almost always in the middle cerebral. Again, we find it stated that “embolisms of branches of the carotid, renal, and iliac vessels are nearly always on the left side, as they follow the more direct continuation of the main stream in the aorta.”* This statement, taken in connection with the fact that the left middle cerebral is exactly the vessel which in these cases was much the most frequently affected, is of some importance as an indication of the direction in which the causation of aneurisms should be investigated, though by no means sufficient to base any statement upon. As already noted, certain authors strongly advocate this view, and certainly some of the cases recorded seem distinctly to confirm it. There is one in particular (No. 77), in which death occurred from the cerebral softening produced by the embolism, but in which also an aneurismal dilatation occurred behind the obstruction. It should also be noted, however, that there are only a few cases among those collected in which disease of the valves of the heart was coincident with the aneurism, one of these cases being the first of the author.

* Uhle and Wagner. Allgemeine Pathologie. Ed. 1872. p. 219.

Putting the middle cerebral out of consideration, it will be found that the right side was affected in nearly as many cases as the left, although the balance is still on the latter side. Thus there were 54 cases altogether in which the sides are mentioned. Of these, 34 were left, and 20 right; but subtracting the middle cerebral, 13 were left, and 9 right.

The *size* of the aneurisms in these cases was somewhat varied, from that of a "withered grain of wheat," or a "grain of small shot," up to a "plum," a "small apple," and a "hen's egg." As a rule the aneurisms were comparatively small, the most frequent comparison being that of a pea, or bean, or a hazel-nut. Thirty-four of the cases are described by one or other of these comparisons, and several others are vaguely indicated as small.

The *comparative frequency* of intracranial aneurisms is a question concerning which considerable difference of opinion may exist. Lebert, in the articles already referred to, states that though so many cases have been recorded, yet that the disease is really comparatively rare. This must, however, be taken with some reservation. Almost all the cases recorded (as will be seen from the note at the end), have been observed within a comparatively recent time, and this leads one to infer that very many cases have been overlooked in former years. Again, the fact that different observers have met with several cases seems to show that when one is alive to the possibility of such a cause of cerebral hemorrhage, it will not be so readily overlooked. Thus, Gull has recorded no less than six cases (Nos. 41, 44, 51-54), Smith four cases (Nos. 47, 76-78), and several others have given two or three cases, as will be seen from the note at the end of this paper. There is one other fact which renders it probable that the disease is more frequent than we would be led to expect—namely, the comparatively small number of recorded cases in which rupture has not taken place. We know that rupture is not an exceedingly frequent termination of aneurism elsewhere; and though there may be conditions within the skull which more strongly predispose to rupture, still this cannot account for

the great difference. We have already noted that a large number of cases presented no marked symptoms before the fatal rupture, and it seems exceedingly probable that there are a large number more which do not rupture, and in which, as no head-symptoms were present during life, the brain was not at all, or only cursorily, examined.

Lastly, the *sex* is mentioned in all the cases except two, and of these 85 cases, 48 were males, and 37 females, or in the proportion of about four to three. This proportion is somewhat different from that of Lebert and Brinton—the former giving five to three, and the latter two to one, as the proportion in their cases.

Note of 87 recorded cases of intracranial aneurism, on which the facts in this paper are based:—

Nos. (1 and 2)—Bright. Medical Reports, vol. 2, p. 266-67; (3) Hare, Pathological Trans., vol. 1849-50, p. 169; (4) Roe, do., vol. 1850-51., p. 46. (5) Van der Byl, do., vii., 122; (6) Squire, do., vii., 125; (7) Ogle, do., vii., 127; (8) Van der Byl, do. vii., 129; (9) Squire, do., viii., 162; (10, 11) Bristowe, do., x., 3 and 4; (12) Murchison, do., xiii., 2; (13) Callender, do., xiv., 64; (14) Fuller, do., xvi., 83; (15) Broadbent, do., xvii. 57; (16) Parsons, do., xix., 102; (17) Bristowe, do., xix., 174; (18 and 19) Church, do., xx., 109 and 111; (20) Semple, do., xx., 112; (21) Bastian, do., xx., 109; (22) Dickinson, xxiii., 1; (23 and 24) Author; (25) Kingston, Edin. Med. Jour., 1842, lvii., 69; (26) Holmes, Path. Trans., xii., 61; (27) Church, St Barth. Hosp. Rep., 1868, 142; (28) Hawkins, Catal. of Mus. of St Geo. Hosp., 357; (29) Ogle, Med. and Chir. Trans., xlii., 403; (30 and 31) Catal. of Mus. of St Geo. Hosp., 835 and 836; (32) Cruveilhier; (33) John Bright, Lancet, 1828-9; (34) Jennings, do., 1832-33; (35) Gordon, Medical Times, xix.; (36) Corfe, do., xvi.; (37) Ruschenberger, Amer. Jour. of Med., do., xii.; (38) Lager Archiv de Med., xii.; (39) Pfeufer, Pfeufer & Henle's Zeitschrift, vol. i.; (40) Serres, Archiv generales, x.; (41) Hodgson on "Diseased Arteries," p. 76; (42) Gull, Guy's Hosp. Rep., 3rd ser., vol. v., 281; (43) Med. Gaz., xxiii.; (44) Med. Chir. Rev., xiv.; (45) Gull, loc. cit.; (46) Francis, Med. Gaz., xxxviii; (47) Smith, Dubl. Jour., xxv.; (48) Crisp, a treatise on the structure, diseases, and injuries of the blood vessels, Lond., 1847; (49) Hare, Lond. Jour. of Med., 1850; (50) King. Med. Quart., 1834-35; (51) France, Guy's Hosp. Rep., iv.; (52 to 55) Gull, loc. cit.; (56) Catal. of Mus. of Col. of Surg., iii., 261; (57) Do.; (58) Crisp, loc. cit.; (59) Thomson, Edin. Monthly Jour., ii., 557; (60) Adams, Lancet, 1869, 768; (61) Stumpff, Berlin, 1836; (62) Fossati, Bull. di Boulogna, 1844; (63) Coe. Assos. Jour., 1855; (64) Heyfelder and Uhde, Deutsche Klin., 1856; (65) Engel. Oest Med. Jahrb., 1841; (66) Tünel, Virchow's Archiv, xvi., 356; (67) v. Sydow. Hygiea. Bd., xxvii., No. 9., 1865; (68) Hayem, Gaz. de Paris, 1866; (69, 70) Lapine, do., 1867; (71) Jackson, Lond. Hosp. Rep., 1864, p. 426; (72) Douglas Edin. Monthly Jour., 1849, 551; (73) Paterson, Edin. Med. Jour., 1859, vol. iv., 722; (74) Struthers, do., 1862, vol. viii., 190; (75) Haldane, do., 189; (76-78) Smith, Dubl. Quart., i., 446; (79) Neil, Amer. Jour. of Med. Sc., 1849, 122; (80) Pepper, do., 1869, 403; (81) Watson, Med. Times and Gaz., 1865, 357; (82) Rogers, Brit. Med. Jour., 1858, 200; (83) Brit. Med. Jour. 1861, 153; (84) Do., 1869, 74; (85) Do., 1870, ii., 87; (86) Do., 1872, i., 424; (87) Ebstein, Wien. Med. Presse, Nos. 2, 3, and 4.

II.—~~TWO CASES OF~~ DISLOCATION OF THE HIP REDUCED BY THE AMERICAN METHOD OF MANIPULATION.

By HECTOR C. CAMERON, M.D.

IN a former series of this *Journal* (July, 1866), I related a case, in which I reduced a recent dislocation of the hip into the sciatic notch by means of the American method of manipulation. I have since met with the two following cases:—

I. *Dislocation on to dorsum ilii of seventeen days' standing. Reduction at first attempt.*

William Lynn, aet. 16, miner, was driving a horse harnessed to some "hutches," in a coal pit, on the 5th September, 1867. The horse ran off, and he, holding on to the reins, was drawn along by it. Being at last brought on to his knees, the hutches came up behind and struck him on the lower part of the back. When he rose he was unable to stand, experienced pain in the left hip-joint, and his "legs clung together the same as if they had been tied with a rope." About two hours after the accident he was seen by a medical man, who recognized a dislocation, and, having produced extension by pulling on the leg, while he kept one of his feet pressed against the perineum, he stated, according to the patient's account, that he believed he had succeeded in effecting reduction; explaining, that the shortening and inversion, which continued to be a source of alarm to the patient and his friends, would in all probability pass off. Thirteen or fourteen days after the accident, the patient still suffering great pain, the doctor returned with a friend. Having administered chloroform, and got the assistance of "two labourers who were working on the road," they produced violent and long-continued extension on the limb, while steady counter-extension was maintained on the axillae. They left after many attempts, and without succeeding in their object. After a day or two of great pain, he was admitted into the Royal Infirmary. I saw him after the house-surgeon in charge had made an unsuccessful attempt at reduction under chloroform. The head of the femur was

on the dorsum ilii, and all the symptoms occurring under such circumstances were clearly marked. Chloroform having been fully administered, I flexed the leg on the thigh, and the thigh on the abdomen, abducted the limb fully, and rotated outwards. During this last movement, I felt the tearing through of adhesions, and the head of the bone at once returned to the acetabulum. On extending the limb, it was seen to be in good position. The patient made a good recovery, and went to the Convalescent Home three weeks afterwards.

II.—*Case of recent dislocation of the hip into the thyroid foramen. Reduction.*

Thomas Yuill, aet. 42, quarryman, was admitted on the 25th April last into a ward of the Royal Infirmary, of which I was in temporary charge.

He had been struck a short time previously by the "jib of a crane," but could not give a very accurate account of the accident. He complained of great pain in his right hip and thigh, and a very slight examination served to show that the head of the femur was in the obturator foramen. There was slight lengthening and marked abduction of the limb; while the knee was slightly flexed, and the prominence of the trochanter was conspicuous by its absence. There was a distinct fulness in the obturator region, although, as the patient was a very muscular subject, the head of the bone could not be defined by the hand. Reduction was effected under chloroform in the following manner:—I flexed the limb as thoroughly as possible, slightly abducted, and then rotated inwards firmly, at the same time adducting the limb and bringing it towards the floor. This resulted in transferring the head of the bone from the thyroid foramen—not to the acetabulum, but to the sacro-sciatic notch. Flexion, abduction and rotation outwards (which so readily transfers the head of the bone usually to the acetabulum in the case of dislocations upwards and backwards), sent it back to the thyroid foramen. A careful repetition of the first set of movements put it again in the sciatic notch; and again as before, in trying to reduce it from that position, I sent it

back to the thyroid foramen. Having again removed it to the sciatic notch, I put my foot in the perineum, and made extension aid my movements, when it slipped at once into the acetabulum. The time occupied was very short, for the head of the bone was changed from the one position to the other with provoking facility. The patient made a good recovery.

The first of these cases illustrates the ease with which a dislocation of the hip may be reduced when extension, fairly and intelligently tried both with and without chloroform, has failed to attain the desired result.

The second case is interesting, chiefly as pointing out a mishap which seems apt to occur in manipulating the thyroid dislocation; namely, the removal of the head of the bone not into the acetabulum, but upwards and backwards into the great ischiatic notch or on to the dorsum ilii. In a paper by Dr Thos. M. Markoe on "Reduction of dislocated femur by manipulation," in the *New York Journal of Medicine* for January, 1855, this is well shown in several of the cases related. In Case IV. the original dislocation was into the sciatic notch, and Dr Markoe says: "The effect of the first attempt was to throw the head on to the obturator foramen, making the limb longer than the other, and producing the deformity characteristic of that dislocation. From this point, by a slight alteration of the movement, the head could be made to slip back to its original position. Between these two points it could be made to play backwards and forwards, but would not enter its socket." Much the same thing is described in several other cases. In all the cases of thyroid dislocation, it would seem that extreme flexion was employed and rotation was found to succeed, whether made outwards or inwards. It seems as if too great flexion is the cause of the bone slipping from the one position to the other without entering the acetabulum. At all events, this is the opinion expressed by Bigelow and Hamilton, and in the case related above I flexed the limb to the fullest possible extent.

Bigelow writes in regard to Dr Markoe's cases of thyroid

dislocation: "These cases are instructive as showing that the head of the bone is directed towards the socket when the Y ligament is wound upon the shaft by rotation, *whether inward or outward*, and they correspond to the results of my own experiments, made before I had read them. . . .

It may be superfluous to add, that in Markoe's case, inward rotation would probably have reduced the bone, had the thigh been less flexed."* Hamilton says: "In one example mentioned by Markoe, it is pretty evident that the head of the femur was thrown into the ischiatic notch, by having flexed the thigh too much, so that 'the knee touched the thorax.' Indeed, it is questionable whether it will be best ever to bring the thigh much, if at all, above a right angle with the body, since any further flexion can only throw the head below the acetabulum, when, in fact, it is already too low."† In backward dislocations, on the other hand, the flexion should be firm and complete. (*Glasgow Med. Journal* ^X)

III.—THREE INTERESTING OBSTETRIC CASES.

By JOHN AIKMAN, M.B., *Guernsey*.

THE three cases which form the subject of this paper are the more important of what might almost be termed a series occurring during the last twenty months. A brief analysis of the remainder may therefore not be inappropriate.

The total number attended was 32. One has been already recorded in the number of this *Journal* for February last, as a "successful case of transfusion, &c." One case of instrumental delivery, for contracted passages, was handed over to me by the kindness of my principal, Dr Francis Carey, and another of the same nature I delivered for my friend, F. J. de Lisle, Esq. Of the remaining 29, two were twin labours. The first was a simple case—two girls, breech and head presentations, and in separate amniotic sacs. In the second both children presented head.

* The Mechanism of Dislocation and Fracture of the Hip.

† A Practical Treatise on Fractures and Dislocations.

The first was a full grown, but dead, and somewhat decomposed child, while the second was a shrivelled foetus of five or six months. Separate amniotic sacs, but one placenta. Six were miscarriages. Two occurred in January, 1872, one on August 18th, another August 21st, and another September 11th of the same year, and the last on January 4th, 1873. These dates may seem unimportant, but as they were associated in time with an unusual number of similar cases in the practice of my principal, I record them, postponing further comment. Another was a premature labour—a seven months child, dead—apparently from placental disease. The lady has lost several children at the same period, while her early pregnancy is always accompanied by repeated and serious hæmorrhages. The three cases about to be detailed having been deducted, leave us with 17 natural labours. Even that small proportion must be encroached upon—one was complicated by serious hæmorrhage $3\frac{1}{2}$ hours after the birth of the child; another by the occurrence of colic dependent upon the passage of gall stones; and a third by loss of sensation in the left arm, continuing for a month after delivery. Such a proportion of *unavoidably* unusual cases is fortunately rare, and may prove, I hope, not uninteresting.

CASE I.—*Placenta Prævia—mother and child both saved.* On January 1st, 1872, I removed from this patient the placenta of an ovum at the 3rd month.

At 11.15 A.M., on March 10th, 1873, I was again called upon to attend her. She believed herself to be eight months advanced in pregnancy, and stated that for two days she had been losing blood. This morning, for the first time, she had had labour pains, with each of which blood gushed from her. In the intervals a steady flow was maintained, but during a pain she described the hæmorrhage as a “gush.” Patient was very much blanched, almost pulseless, and had frequent faintings.

On examination, the vagina was found to be full of clot. These having been removed, the “os,” dilated to the size of a florin, was reached, and the placenta found presenting

with the head behind it. The hand was then passed into the vagina, and all of the placenta that could be reached with one finger behind the "os" detached. The placental edge being evidently just beyond the finger, a second was introduced, and, by dint of scraping, the membranes punctured and the liquor amnii allowed to escape. The uterus contracted, though feebly, upon the child, and counter-pressure was maintained by a plug. No hæmorrhage having occurred, matters were left to nature until shortly after 2 P.M., when I obtained the assistance of Dr Carey. The patient in the meantime having somewhat recovered the immediate effects of the hæmorrhage, I removed the plug, and found the "os" nearly fully dilated. Turning was at once determined upon—so, seeking the direction in which I had punctured the membranes, I easily reached the foot and soon effected delivery. The child, a girl, was born still, but soon resuscitated by insufflation, and lived until the evening of the 12th, when it was found dead in bed. The placenta immediately followed the birth of the child.

The mother made an excellent recovery, and, although some time elapsed before she regained her colour, she is now in perfect health.

Several points in this case deserve remark.

1st. That hæmorrhage ceased, although the whole placenta was not detached. This is merely a further corroboration of a well-established obstetric principle.

2nd. I punctured the membranes with an almost certain prospect of having to turn. This I did because hæmorrhage was the most urgent symptom, and, by obtaining the direct pressure of the hand upon the placenta, I doubly secured against it. On the other hand the pains had been so slight that I did not anticipate from them any serious hindrance, and in this I was not disappointed.

3rd. The method of Resuscitation. Insufflation is not at all a new means; but, for some reason or other, is not in favour with the Glasgow school; so much is this the case that I had never seen it practised until within the last twenty months. Since then I have several times resorted to

it with such success as would induce me to prefer it, above all others, as a *first effort*. Respiration once feebly established, I should prefer Sylvester.

CASE II.—*Elbow presentation—membranes four days ruptured—turning—mother recovered.* Was called to see the patient, a primipara, on the morning of July 4. Three days previously the membranes had ruptured and the liquor amnii drained away. No regular labour pains had occurred, but patient complained of an ill-defined aching.

On examination, a joint, which was diagnosed as elbow, was found presenting at an “os” dilated to the size of a florin. The head could be felt in the left iliac fossa, and the breech rather high upon the opposite side. By the same evening, little advance had taken place, and as the patient was much exhausted, rest was preferred to operative interference. She therefore had fifteen min. Liq. Opii Sedat. (Battley).

July 5, 10 A.M.—Patient has had a tolerably quiet night, but for the last two hours uterine pains have been fairly severe.

The “os” was found sufficiently dilated to permit of turning. Dr Carey having put the patient fully under chloroform, the presenting limb was pulled down. It proved to be the right arm—thumb towards pubis, palm towards left thigh. Very considerable difficulty was experienced in introducing the hand, and also in its progress within the uterus. Patience and gentle pressure at last enabled me to reach a foot, which, on being brought sufficiently low to be freely handled, proved to be the right. It was therefore abandoned, and the search for its fellow proceeded with. After some time it was found at the very fundus. It seemed as though the efforts of the uterus had separated the knees and driven the child’s legs from the surface of its abdomen—an awkward circumstance, probably rendered more so by my having in the first instance, brought down the wrong foot. With considerable difficulty turning was effected and delivery completed. The child, a boy, was quite dead when born. The placenta soon came away, and the mother made an ex-

cellent recovery. In this case, as in all I have had where the uterus has been severely handled, I kept the patient gently under the influence of morphia for three days after delivery. This practice, which I learned from Dr J. G. Wilson, of Glasgow, has seemed, as far as my small experience goes, to be productive of the most pleasing results. The prescription is Dr Wilson's, given me in 1868:—

| | | | |
|---|--------------------------|---------|------|
| R | Liq. Morphiæ Hydrochlor. | - | 3i. |
| | Spr. Chloroformi | - - | 3ii. |
| | Aquam | ad. - - | 3vi. |

Sig. Cap. cochlear. mag. i 4ts horis.

Whether the child's life might have been saved had we artificially dilated the "os" with Barne's bags when the patient was first seen, I leave an open question. Dr Carey's experienced judgment dictated the course pursued, and the patient's excellent recovery seems amply to confirm his opinion.

CASE III.—*Puerperal convulsions—instrumental delivery—recovery.* A young girl of 17 years, whose father is in confinement as a dipsomaniacal lunatic. She herself is of weak mind, but not so imbecile as to be incapable of recognizing right and wrong.

April 15, 10.30 A.M.—Was called to see patient in labour. Friends state that at seven o'clock this morning she had a "convulsion," which has been repeated twice. The description of convulsion was vague, and as I had no history to guide me, and could find no swelling of the feet, I hesitated to accept the fact of its occurrence. The girl was stupid, but not more so than naturally, and I noted a number of ecchymotic spots on the neck and upper chest. The "os" was fully dilated, the presentation cranial second position, and the passages roomy, all of which, with fair pains, induced me to prescribe patience and a drop of croton oil.

A few minutes after 11 o'clock, without any apparent warning, she was seized with a violent epileptiform convulsion. This lasted $3\frac{1}{2}$ minutes and was followed by coma. During the later stages of the attack there was much lividity,

and the number of ecchymotic spots was markedly increased. So soon as prudence permitted I applied and easily delivered by forceps. A slight perinaeal rent took place. The child was born still, but after twenty minutes perseverance with artificial respiration began to breathe, and in an hour was pretty well. The placenta was found detached, and removed, fifteen minutes after the child was born.

During delivery the girl was quite unconscious, but as soon as the power of swallowing was recovered, another drop of croton oil was given and acted freely. She then recovered consciousness and talked quite rationally. I had hoped that so soon as the uterus was emptied the danger of convulsion was over, but at 12.30 P.M. a violent one occurred, lasting quite four minutes, but followed by a return to consciousness.

3.40 P.M.—Two convulsions since last note, but neither severe. One at 2 P.M., and the other at 3.30 P.M., from which latter she is still stupid.

Pulse, 112. To have 6 grs. benzoic acid, to be repeated in two hours.

8.15 P.M.—Has had 7 convulsions since last note, some, according to nurse, lasting 8 minutes. There is marked divergent squint, and the pupils are minutely contracted. The cornea can be touched without producing reflex action, there is great restlessness, and the pulse is uncountable. Bowels have acted and urine passed unconsciously. Ascertained by experiment that patient could swallow, and ordered 15 grs. potass. bromide every four hours.

April 15, 7.15 A.M.—Since last report 7 convulsions. She has never recovered consciousness, and is in the state described in last note.

11 A.M.—No further convulsion, but is still very stupid, and the evacuations take place unconsciously. P. 92. Was fed with a beaten-up raw egg, and given also 3i. potass. brom. Ordered to have 3ss. every four hours.

6 P.M.—No further convulsion. Is fairly rational, and has eaten well. P. 88. Recognizes all around her except doctor, whom she believes she meets for the first time.

April 17, 11 A.M.—Is as rational as before her confinement. Will not believe she has given birth to a child, and refuses to suckle it. There is milk in the breasts. Reduce the dose of potass. brom. to 15 grs. three times a day.

There is nothing further in the case worthy of detail. Notes were made until April 28, when I find this record, "mother and child both well."

The recovery of a woman after 21 puerperal convulsions is not common. Seventeen of that number occurred after the exciting cause had been removed, this in itself of very grave prognostic import. It is interesting to note that the uterus throughout maintained its contraction well, and that even in the coma which prevailed during delivery, the pains were strong.

I felt interested to know whether this girl would become a confirmed epileptic, but recent enquiry shows no evidence of this. I shall still be anxious to know what symptoms will follow her first menstruation after suckling.

I tried gallic acid in this case, because I had recently been peculiarly gratified with its action in convulsions occurring in the course of renal disease, and can only now regret I did not from the first administer the bromide.

IV.—ON SUFFOCATION DURING A FIT IN CASES OF EPILEPSY.

By T. ALGERNON CHAPMAN, M.D., Medical Superintendent of the County and City Asylum, Hereford.

THERE is a form of death from epilepsy that is well known in asylums, and has, up to the present time, been sufficiently common, although it appears to be almost unknown to the profession outside of special institutions. My object in submitting the following notes of cases is not so much to draw attention to it, as to record the fact that none of the instances which have occurred within my own experience have occurred in what is supposed to be the most usual manner. The form of death in question is that by suffocation during

a fit, and the most usual mode of its occurrence is during the night, in consequence of the patient turning over on to the face in a fit, and burying the nose and mouth in the pillow or bed-clothes.

Post-mortem examinations were made in all the instances, which verified the cause of death in each case as asphyxia.

I am indebted to Dr Glendinning for the following abstract of the cases that occurred during my residence at Abergavenny:—

CASE I.—*History*.—E. L., female, aet. 35, admitted 26th August, 1858. A domestic servant. Has been insane for 12 years. At times worse than at other times. Was never in an asylum. She has been getting worse, and during the last nine days has been quite unmanageable. Epileptic for twelve years, the attacks being frequent. Her mother was weak in mind.

On admission, she is of short stature and stout, and appears to be in tolerably good bodily condition. She has an imbecile expression. Is quiet, but is evidently very weak in mind.

April 15, 1865.—Has not been at laundry for some time. Fits still frequent; is more demented than she used to be.

July 28, 1865.—Was found dead this morning lying on the floor in her dormitory, with her head so placed against the wall as to double her chin down on to her chest, as she lay on her back. She appears to have been dead about two hours.

CASE II.—T. L., male, aet. 23, admitted July 19, 1853, of middle stature, dark hair and complexion, rather robust and apparently in good bodily health. When a child he had a severe fall on the back of his head, and also fractured his collar bone. Since that time he has been subject to epilepsy; of late it has been frequent and severe, and he frequently injures himself by falling. He has been in confinement before, and is reported to be generally orderly, quiet, and well conducted.

August 8, 1860.—This patient is subject to epileptic fits, which continue for a couple of days and give place to great

excitement, which remains for three days or a week. These attacks occur at intervals ranging from a month to six weeks.

April 22, 1865.—Has been taking Pot. Bromid. for eight or ten weeks, and has had no fits for eight weeks, having passed over one if not two periods of attack. An attack of mania of a few days' duration, and of the same character as that following his fits, probably represented an attack about three weeks ago.

November 28, 1865.—Was found dead at 1.25 this morning. Last night he went to bed in his usual health in a dormitory with four other patients, two of whom were intelligent. The night attendant saw him alive in bed at 11.15 P.M. On visiting the room again at 1.25 A.M. he was lying on the floor on his face by the side of his bed, his head resting on his clothes, which were folded up on the floor at the head of his bed. He was seen immediately, but was quite dead.

CASE III.—R. D., male, aet. 21, admitted May 22, 1865. Single; no occupation. Has been subject to epilepsy since he was 11 years old; the attacks occur frequently.

On admission, his aspect was childish, and foolish looking, saliva dropping from the mouth; and was quite stupid, unable to speak or understand questions. Is more than six feet in height, with rather a small head. In moderate bodily health and condition.

Nov. 21, 1867.—Yesterday he had two fits; last night he was all right at the regular visits of the night attendant at about 11 P.M. and 2.15 A.M. At 5.10 this morning he was found lying on the floor, his head resting between the bed and chair, which stood at the head of his bed, his face being turned to the mattress, which covered his mouth; and his neck much bent forwards. When seen immediately he was quite dead, and had probably been so ten or fifteen minutes. Several other intelligent patients in the dormitory had heard nothing.

CASE IV.—A. H., female, aet. 35, admitted December 19, 1868. Single; labourer. Has been epileptic for at least six

years, probably much longer. She has several fits about every fortnight.

On admission, though said to be better than usual, is obviously much demented. Unable to give any distinct account of herself. In fair general health and condition.

June 7, 1869.—Since last entry (April 14), is not recorded to have had any fits, except two on May 7. She had become very useful in the ward, and, except some dementia, was tolerably well in mind. This afternoon she left the ward for the Airing Court about three o'clock, where she was seen soon after. About a quarter-past four she was found in one of the water-closets in the Airing Court dead, and appeared to have been so nearly an hour. She was sitting on the seat of the closet with her head and shoulders resting against the wall at the back, and her chin resting on her chest, and face and lips were darkly congested, and the clothes under her chin were moist with saliva, the appearance indicating that she had had a fit.

CASE V.—A. S., female, aet. 36, admitted March 20, 1868.—Single; domestic servant. Fourth attack of a week's duration. Cause, epilepsy, to which she has been subject for eight years. An attack nearly every fortnight, and usually two fits at every attack.

On admission, is in a somewhat emotional state, crying, fearing she is going to be burnt, etc., giving much the impression of hysteria. Bodily condition moderate.

June 11, 1869.—Was found dead this morning at 6.30, and had apparently been dead about or rather more than an hour. Her head had fallen over the bed, so that she rested with her face on the bed-side carpet, which had marked by pressure one side of her face, showing that her nose and almost all her mouth had been occluded. She had been seen by night attendant at 4.30 A.M., and an intelligent patient in next bed heard her have a fit and fall out of bed, and saw her resting on the floor, but made no effort to relieve her. She thought she was about two hours before she was found. She had had no fits during the day since April 4, but during the night she had had a fit on each of the follow-

ing days in the morning—May 6, 11, 21, 29, June 7, and earlier on the night of the 9th.

CASE VI.—S. J., female, aet. 19, admitted July 1, 1868. Single; labourer's daughter. Has been epileptic since 12 years old, but mind not affected until last six months.

On admission, quiet and stupid, countenance that of considerable dementia. In moderate bodily condition.

Oct. 16, 1869.—Had been rather stupid, but was not known to have had any fits lately. This morning, was found at 6.45 lying on her face on the floor, her feet being partially on the bed, quite dead. She had been seen quietly asleep at 4.45 A.M. Her face did not rest on the floor, but was partially supported by her left arm and shoulder, her neck being bent forward, her tongue protruded about $\frac{3}{4}$ of an inch between her teeth, which held it closely and had bitten it. It quite filled up the mouth. The face was darkly congested. All exposed parts were very cold, but those covered up were only slightly diminished in temperature. There was no *rigor mortis*.

CASE VII.—N. J. D., male, aet. 18, admitted December 28, 1867. Single; no occupation. Four years ago he was nearly drowned by falling into hold of ship whilst he was at play. His father is confident that he did not fall in consequence of a fit. He was laid up for several days, but seemed as well as ever for the next four or five months, when he had an epileptic fit. Has since been subject to them.

On admission, is quiet, very stupid, can answer simple questions if his attention is kept roused. In moderate bodily condition.

Oct. 18, 1869.—Continued much the same, having series of fits at intervals. He commenced to have such a series yesterday, and had several severe fits during the night. This morning he was very stupid, lying quietly in bed, and a mattress was placed beside it to prevent his hurting himself in falling out in a fit. He was seen so at or after 10.30. He was in a single room, of which the door was shut, but not fastened. At 11.15, he was found out of bed,

lying on his face on the mattress, the bed clothes pulled over with him. His nose and lips were compressed by the mattress, and his face was blackly congested. He was quite dead, his extremities cold, portion of his head, which was uncovered, and his body quite warm. No *rigor mortis*.

The following case occurred in this Asylum:—

CASE VIII.—G. G., aet. 31, admitted March 14, 1871, had been epileptic probably from birth; fits frequent, often noisy and quarrelsome, and on several occasions violently excited.

April 7, 1871.—Has had several fits at intervals.

December 27, 1872.—Has had several fits since last report (Nov. 15); has a black eye caused by falling in a fit.

January 7, 1873.—Was found dead this morning at 1.45. For the last three weeks he has occupied a single room (at night), having recently become very restless and quarrelsome. The night attendant heard him in a fit shortly after 11.30. He remained with him till the fit was over, and left him all right in bed, and saw him again shortly after 12. At his next visit he found him on the floor quite dead. When seen immediately, he had apparently been dead less than an hour. He lay on his back, with his head close up to the wall, and a little inclined to the left side. There was a very slight abrasion on his left temple, as if caused by his having fallen on the mat by his bedside. There was some frothy saliva about his mouth.

Of these eight cases one occurred during the day, the other seven during the night, and these seven had all fallen out of bed, not one had simply turned on his face in bed, though one had his face pressed against the mattress on which he lay, it being kept there by a chair by his bedside after his body had fallen to the floor. They were all sleeping in ordinary bedsteads about 18 inches from the floor. In four instances the nose and mouth were more or less occluded. In three the obstruction arose merely from an awkward position of the neck and in a fourth from this in connection with the congested tongue held between the teeth.

Many varieties of porous pillows have been invented to

obviate such accidents, and all have been supposed to be more or less successful; yet it may be remarked that no such arrangement would have been useful in any of these instances.

There is one consideration that occurs to me in connection with the matter, and that has reference to the possibility of some of the cases, having been less unlucky had they slept in bedsteads with sides. It is not unusual to provide such bedsteads to prevent epileptics from falling out of bed, not with any reference to the present matter, but merely to save bruises from falls on the floor, and I have heard the fear expressed that such sides might facilitate suffocation by confining the head to the pillow. I have observed that epileptics sleep on their backs, or on one side, at least as frequently as others, and an attendant can see that none are allowed to continue to sleep in a prone position. Now, if a fit occurs, and the patient maintains the position in which he is, he is tolerably secure, but, should he turn over, it is different. It is necessary to observe that in turning over he does not merely rotate continuing in the same part of the bed, but rather rolls or throws himself over, coming on to his face on the adjoining portion of the bed; or, if there be no such portion, he falls on the floor to meet with fresh dangers. But if he meets with a side to the bedstead, he neither falls to the floor nor completes the rolling over, but falls back again into his former position, where he is tolerably safe.

There is one other precaution which may, to a certain extent, be relied on—that is, in having others sleeping in the same room who could render assistance, and no doubt many accidents are prevented in that way, yet in four out of these cases the precaution was futile. In three of the other cases the patients occupied single sleeping rooms, on account of restlessness, noise, or violence, which prevented the possibility of associating them with others.

It is obvious, therefore, that this accident cannot be obviated by any precaution short of having the patient under constant supervision. No frequency of visits will suffice, as a few minutes are probably sufficient to bring about the fatal

result. This constant supervision is now strongly insisted on by the English Commissioners in Lunacy, and is put in practice in several English Asylums. There are difficulties in the way of applying it in all cases, especially in the cases of patients requiring single sleeping rooms, and also where there are no dormitories of suitable size and arrangements. In all new asylums and additions to old ones, the provision of accommodation suitable to this purpose should be attended to.

V.—CLINICAL SURGICAL REPORT FOR THE YEAR 1872.

By GEORGE BUCHANAN, A.M., M.D., *Surgeon and Lecturer on Clinical Surgery, Glasgow Royal Infirmary; Professor of Anatomy Anderson's University, &c.*

DURING the year from 1st January, 1872, till the same date, 1873, there were admitted to residence in my wards 485 patients. Of these 317 were males, and 168 females. This is exclusive of the out patients, of whom a large number were admitted temporarily and were dismissed the same with their injuries attended to. Of the whole number admitted, 455 were dismissed cured or relieved, and 30 died. Of those who died, the great majority were admitted in a hopeless state, the severity of the disease or injuries being such as to preclude all expectation of recovery. It is a great pity that so many patients are sent to the Infirmary in the most advanced stage of disease, as a last shift after all other means have failed. Not only does it increase the number of deaths in the Institution, but the more important consideration is that these almost moribund patients take up beds which might be occupied by those who have a fair prospect of recovery. This is a point that needs attention in an hospital like ours which derives so much of its income from the working classes; and it is principally in consequence of these requirements that the practice obtains of sending out a patient, if capable of being removed, as soon as it may become evident that there is no prospect of amendment from a longer residence.

The following table shows the casualty list of admission to my wards to residence:—

TABLE OF FRACTURES, DISLOCATIONS, &c.

| | | | | | |
|-----------------------------------|-------|--|--|------------------------------|-------|
| SIMPLE FRACTURES— | | | | Scalp wounds, . . . | Many. |
| Thigh (<i>Including 5 Intra-</i> | | | | Cut throats, . . . | 2 |
| <i>capsular</i>), . . . | 27 | | | | |
| Tibia and Fibula, . . . | 15 | | | | |
| Tibia, | 4 | | | COMPOUND FRACTURES— | |
| Fibula, | 4 | | | Thigh, | 1 |
| Humerus, | 9 | | | Tibia and Fibula, . . . | 9 |
| Radius and Ulna, . . . | 8 | | | Tibia, | 2 |
| Radius, | 6 | | | Humerus, | 1 |
| Clavicle, | 9 | | | Skull, | 3 |
| Ribs, | 3 | | | Radius and Ulna, . . . | 1 |
| Spine, | 3 | | | Fingers, | 13 |
| Pelvis, | 1 | | | Metacarpals, | 2 |
| Skull, | 2 | | | Pelvis, | 1 |
| Lower jaw, | 1 | | | Nasal Bones, | 1 |
| Metatarsals, | 1 | | | Frontal Bones, | 1 |
| Metacarpals, | 2 | | | | <hr/> |
| Olecranon, | 1 | | | | 35 |
| Scapula, | 1 | | | | <hr/> |
| Fingers, | 1 | | | DISLOCATIONS— | |
| | <hr/> | | | Hip, | 1 |
| | 98 | | | Shoulder, | 11 |
| | <hr/> | | | Both bones of the forearm, . | 2 |
| SMASHES— | | | | Radius, | 1 |
| Leg, | 9 | | | Lower jaw, | 1 |
| Arm, | 5 | | | Fingers, | 3 |
| Foot, | 3 | | | Thumbs, | 2 |
| Hand, | 10 | | | Clavicle, | 1 |
| Forearm, | 2 | | | | <hr/> |
| | <hr/> | | | | 22 |
| | 29 | | | | <hr/> |
| | <hr/> | | | | |

From the list of operations appended, it will be seen that 159 operations of greater or less magnitude were performed. Of these 10 ended fatally, the remainder, 149, recovered. The first point of interest is the conditions under which a fatal result followed an operation, and may be noted shortly as follows:—

Amputation of thigh.—The two fatal cases were compound fractures of the bones of the leg. One was a primary and

the other a secondary amputation. In the first case the patient was an habitual drunkard, and under the influence of liquor on admission, after the operation he became delirious and never rallied. In the second case there was an attempt made to save the limb by antiseptic treatment; but acute gangrene set in in the foot from the great amount of bruising, and laceration of vessels, and amputation was deemed necessary; however, gangrene set in, in the stump, and the patient gradually sank twenty-four hours after the operation.

Amputation through Hip-Joint.—For malignant tumor of the femur. The patient was a very emaciated subject. He died fifteen days after the operation, and, at the inspection after death, it was found that the lungs were infiltrated with cancerous deposit.

Amputation of Leg.—This was a severe smash of both legs. Double amputation was performed below the knees, by Dr Patterson. The patient died of shock a few hours after the operation.

Herniotomy.—This fatal case was an old man over 60, who had led a life of dissipation, and was in a very unfavourable condition for operation; he died five days after the operation, having suffered from delirium, some hours before death.

Ovariectomy.—Three cases, all fatal. In two of the cases there were numerous adhesions, which were broken up and the tumor excised with considerable difficulty. One case was fatal thirty-six hours after operation, of shock, and the other forty-eight hours after operation, peritonitis having set in.

The third case was free from adhesions, the pedicle was so short the clamp could not be used. This patient was of a very nervous temperament, and never appeared to rally from the shock, but gradually sank forty-eight hours after the operation.

Excision of mamma.—This fatal case was complicated with pleurisy and secondary deposit of cancer in the lungs. The patient lived fourteen days after operation.

Ligature of the Femoral Artery.—In this case the vein was also wounded, and a detailed account of it is subsequently given.

The particulars of the cases of operation are sufficiently noted in the table; two only being of special interest as being rare, on each of which a few notes may be added.

Case of traumatic aneurism of the femoral artery at the groin.
—A butcher's lad, about 19 years of age, was engaged in cutting beef from a bone, when the knife slipped, and made a wound an inch deep in the upper part of his right thigh. The accident happened at night, and a medical man who was called applied a pad and bandage, and sent the patient to the Infirmary. As it was late at night when he arrived, and hæmorrhage was completely arrested, and the patient was weakened from loss of blood, the house-surgeon allowed him to rest in bed, giving him repeatedly small quantities of brandy and hot water. He rallied somewhat by the visit hour, 9 A.M., when he was taken to the theatre for operation. The operation was tedious and troublesome owing to the wound being just below Poupart's ligament. When the bandage was removed, the wound, which was about an inch long, was found to be plugged with clot, and pulsation was quite visible. Pressure being made above the ligament to partially arrest the circulation, I made an incision three inches long into the swelling, including the wound in it. I then turned out the clot and thrust my left fore-finger into the wound which effectually plugged the hole in the vessel. Getting the edges of the wound well held aside, with considerable difficulty I got the upper part of the artery exposed, and an aneurism needle slipped round it above the seat of the injury. The search for the lower part of the artery was even more difficult, the parts having been matted together a good deal by the pressure, and the moment I moved the finger which was plugging the artery, a gush of blood took place. However, in the end, the vessel was securely ligatured below the bleeding point. To my dismay, however, no sooner was my finger removed than the wound filled with dark blood, and on examining carefully, I found

a large wound on the side of the femoral vein, the knife having evidently cut open the vein as well as the artery. I made several systematic attempts to apply a ligature to the vein laterally so as not to occlude it, but the wound was so large that this was impossible. I then attempted to plug the wound in such a way as to leave some hope that the hæmorrhage would be arrested, but on each occasion the blood at once welled out to such an extent that death from hæmorrhage would soon have occurred if it had been left in that state. Nothing now remained but to apply a ligature to the femoral vein, with the view of saving life for the present, and I sent the patient to bed with the determination that if he should rally in a few hours from the loss of blood from the injury, and shock of the prolonged operation, I would give the slender chance which would be afforded by amputation at the upper part of the thigh. He, however, gradually sank, and died in the afternoon. This is now the fourth case of traumatic femoral aneurism which has come under my charge, all the others having been attended with a successful result.

Esmarch's operation for closure of the jaw.—The patient was a lad aged 16, who was under my care eight years ago for deformity produced by cancrum oris. At that time an aperture, the size of a five shilling piece, existed in his right cheek, extending from the situation of the angle of the mouth to the surface of the masseter muscle. The whole of the soft tissues from the gum to the skin were matted together, so that the jaw was almost quite locked, a little movement existing on the left side. At that time he could feed himself with spoon meat, and was very healthy. I began by a plastic operation, dissecting the cheek from the upper jaw and masseter, and making a large flap from the skin over the lower jaw and upper part of the neck. This flap I slipped up and attached to the upper one, drawing together the edges of the wound in the neck. The result was a most satisfactory one, the aperture in the mouth being completely filled up, and the boy provided with a most efficient cheek.

A year subsequently he again came to me to see if I could help to restore the movements of the jaw. This I tried to do by dividing underneath the cheek with a narrow knife such amount of hard material as I could reach, and then endeavouring to force the jaw open with a screw gag, without effecting much. As, however, a little movement was obtained, I requested the boy and his friends to persevere with the gag, and endeavour to gain a little more movement by patient efforts. This they promised to do.

Being now 16 years of age, and determined to obtain some more space in his mouth, he returned, and begged that I would undertake some more decided operation. Accordingly having satisfied myself that the left half of the mouth was quite sound, I made an incision through the lip opposite the canine tooth of the right side, and dissected back the skin a little on each side. I then removed with Hey's saw a wedge-shaped bit of the lower jaw, of which the canine tooth was the apex, and the base about an inch of the lower border of the bone. The wound soon united, and the sawn edges of the bone became attached to each other by fibrous matter, and in about ten days the boy could open his mouth freely, the incisor teeth of one jaw being separated from those of the other about an inch. He soon acquired the power of chewing solid food, a satisfaction he never had during the whole of his life previously.

TABLE OF OPERATIONS BY DR G. BUCHANAN, 1872.

Eight Amputations of the Thigh—Six Recoveries and Two Deaths.

| | | | | | | |
|------------------------|------------|--------------------------------|----------------|-------------------------|----------------|---|
| N. C.,aged 54... | Jan. 6... | Compound fracture of leg | Amput. " | through condyles | Died | Habitual drunkard. |
| A. M., " 18... | " 20... | Gangrene of leg | " | lower 3d of thigh | Successful ... | " .. |
| P. D., " 26... | " 31... | Compound fracture of leg | " | condyles | " .. | " .. |
| J. S., " 21... | Mar. 26... | Disease of knee-joint | " | lower 3d of thigh | " .. | " .. |
| G. S., " 23... | Apr. 21... | Smash of leg | " | condyles | " .. | " .. |
| J. C., " 44... | Aug. 3... | Disease of knee-joint | " | " | " .. | " .. |
| M. R., " 14... | " 9... | " | " | " | " .. | " .. |
| J. M'K., ... " 25... | Nov. 13... | Compound fracture of leg | " | " | Died | Acute gangrene in stump, due to severe bruising of tissues. |

One Amputation through Hip Joint.

| | | | | | |
|------------------------|------------|--------------------------------|--------------------------------|------------|--|
| J. C.,aged 22... | Feb. 16... | Malignant tumor of femur | Amput. through hip-joint | Died | Secondary deposit in lungs and other organs. |
|------------------------|------------|--------------------------------|--------------------------------|------------|--|

Three Amputations of Leg.

| | | | | | |
|------------------------|------------|---------------------|--|----------------|--------|
| A. M.,aged 19... | June 19... | Smash of foot | Amput. (Teale's method) | Successful ... | Shock. |
| R. B., " 62... | " 24... | " both legs | Double ampu. below each knee | Died | " .. |
| W. H., " 56... | Nov. 1... | " foot | Amput. below knee. The right arm was also amputated. | Successful ... | " .. |

Three Amputations at Ankle—(Two Syme's Method and One M'Kenzie's Method.)

| | | | | | |
|------------------------|------------|------------------------|------------------------------------|----------------|------|
| J. T.,aged 10... | May 4... | Caries of tarsus | Amput. at ankle (M'Kenzie's) | Successful ... | " .. |
| J. G., " 20... | Aug. 17... | " | " (Syme's) | " .. | " .. |
| P. F., " 6... | Sept. 4... | " | " | " .. | " .. |

Five Amputations of the Arm.

| | | | | | |
|--------------------------|-------------|------------------------------|-------------------------------|----------------|------|
| A. M'C.,aged 43... | Mar. 12... | Smash of fore-arm | Amput. through condyles | Successful ... | " .. |
| F. M., " 27... | " 16... | " | " | " .. | " .. |
| D. G., " 22... | " 17... | Disease of elbow joint | " | " .. | " .. |
| J. S., " 14... | Sept. 17... | Smash of fore-arm | " | " .. | " .. |
| M. R., " 23... | Oct. 2... | " arm | " shoulder-joint | " .. | " .. |

Seven Amputations of Fore-arm.

| | | | | | |
|------------------------|------------|---------------------|-------------------------------|----------------|------|
| T. B.,aged 17... | Jan. 11... | Smash of hand | Amput. through fore-arm | Successful ... | " .. |
| R. W., " 21... | " 16... | " | " | " .. | " .. |

| | | | | |
|------------------------|------------|-------------------------|-------------------------------|---------------|
| M. W.,aged 23... | Mar. 19... | Caries of carpus..... | Amput. just above wrist | Successful .. |
| T. S., " 21... | Apr. 5... | Smash of fore-arm | " " below elbow | " " .. |
| R. M., " 27... | June 24... | " " hand | " " at wrist joint | " " .. |
| W. H., " 56... | Nov. 1... | " " fore-arm | " " below elbow | " " .. |
| D. M., " 48... | Dec. 11... | " " hand | " " at wrist-joint | " " .. |

Twenty-Five Amputations of Fingers and One of the Thumb.
All Successful.

Five Amputations of Toes.
All successful.

Three Excisions of the Elbow.

| | | | | |
|-----------------------|------------|----------------------|---------------|---------------|
| A. B.,aged 4... | Apr. 15... | Strumous elbow | Excision..... | Successful .. |
| A. A., " 26... | " 18... | " " | " " | " " .. |
| M. M., " 20... | Nov. 26... | " " | " " | " " .. |

Eight Excisions of Bone.

| | | | | |
|------------------------|-----------|-----------------------------|-----------------------------|---------------|
| J. M.,aged 18... | Jan. 3... | Neerosis of tibia | Removal of sequestrum | Successful .. |
| L. M., " 13... | " 30... | " metatarsal bone | Excised | " " .. |
| M. T., " 13... | Feb. 2... | " humerus | Removal of sequestrum | " " .. |
| D. M., " 16... | May 22... | " metatarsus | Excised | " " .. |
| H. C., " 57... | " 24... | Exostosis of tibia..... | " " | " " .. |
| A. S., " 28... | June 6... | Neerosis of lower jaw | Removal of sequestrum | " " .. |
| A. S., " 14... | July 2... | Caries of os calcis | " diseased portion (gouged) | " " .. |
| A. D., " 8... | " 19... | Neerosis of tibia | " " of sequestrum | " " .. |

Eleven Dislocations of the Shoulder.

All successfully reduced.

One Dislocation of both Bones of the Fore-arm Backwards.

One Dislocation of Radius.

All successfully reduced.

One Dislocation of the Hip. (On dorsum.)

Successfully reduced.

One Dislocation of Lower Jaw.

Successfully reduced.

Three Dislocations of Finger and Two of Thumb.

Successfully reduced.

Dislocation of the Clavicle. (Outer end.)

Successfully reduced.

Two Cases of Lithotomy.

| | | | | |
|------------------------|-----------|---------------------------|------------------------|----------------|
| W. P.,aged 24... | Sept. 22 | Stone in the bladder..... | Rectangular Staff..... | Successful ... |
| R. L., " 20... | Nov. 8... | " | " | " |

Four Cases of Hernia.

| | | | | |
|------------------------|------------|--|-----------------------|----------------|
| M. F.,aged 56... | Jan. 1 | Strangulated femoral hernia..... | Herniotomy..... | Successful ... |
| P. C., " 60... | May 15... | " oblique inguinal hernia..... | " | Died..... |
| H. P., " 23... | June 27... | Reducible oblique inguinal hernia..... | Wood's Operation..... | Unsuccessful |
| P. B., " 39... | July 27... | Oblique inguinal..... | Taxis..... | Successful ... |

Three Cases of Ovariectomy.

| | | | | | |
|------------------------|-----------|--------------------|------------------|-----------|--------------------------------|
| M. C.,aged 54... | Mar. 16 | Ovarian tumor..... | Ovariectomy..... | Died..... | Shock—Pleuro-pneumonia set in. |
| Mrs C., " 40... | July 2... | " | " | " | Shock. |
| M. W., " 43... | Aug. 8... | " | " | " | Peritonitis. |

One Case of Forcible Dilatation of Urethral Stricture.

Treated with Holt's Dilator—Successful.

One Case of Tracheotomy.

Successful.

One Case of Vesico Vaginal Fistula.

Usual operation. Improved.

Seven Cheilo-Plastic.

| | | | | |
|------------------------|---------|---|---|---------------|
| A. M.,5 mths... | Mar. 5 | Single harelip..... | Edges pared and stitched..... | Successful... |
| W. M.,8 mths... | " 12 | " | " | " |
| A. G., " 12... | " 12 | " | " | " |
| J. C.,aged 16... | " 28 | Closure of lower jaw (cicatricial)..... | Plastic operation and removal of a portion of lower jaw ... | " |
| J. S.,4 mths... | April 3 | Double harelip..... | Edges pared and stitched..... | " |
| W. W.,4 mths... | " 22 | " | " | " |
| M. C.,6 mths... | Nov. 29 | Single | " | " |

Fourteen Excisions of Tumors.

| | | | | |
|---------------------|-------------|------------------------------------|-------------------------------------|---------------|
| L. R., aged 23... | Jan. 10... | Epulis of jaw..... | Excised..... | Successful... |
| J. K., " " 19... | " 16... | Enlarged tonsil..... | " Guillotine..... | " " " " |
| P. H., " " 31... | Feb. 21... | Small Epithelioma of tongue..... | " " " " | " " " " |
| J. W., " " 49... | " 21... | Tumor of Pharynx..... | " " " " | " " " " |
| J. C., " " 28... | " 23... | Circoid Aneurism..... | Liga. of post-auricular artery..... | Improved.... |
| B. G., " 6 mths... | " 26... | Fibro-vascular nævus of cheek..... | Ligatured—excised..... | Successful... |
| H. B., aged 16... | April 10... | Enlarged tonsil..... | Excised—guillotine..... | " " " " |
| M. A., " 13 mths... | May 3... | Nævus of upper lip..... | Ligatured..... | " " " " |
| M. C., aged 42... | " 30... | Scirrhus of mamma..... | Excision of mamma..... | " " " " |
| G. M., " 50... | June 14... | Epithelioma of cheek..... | Excised..... | " " " " |
| W. S., " 21... | Aug. 21... | Lipoma of abdomen..... | " " " " | " " " " |
| M. E., " 38... | Sept. 17... | Polypus of palate (mucous)..... | Ligatured..... | " " " " |
| J. C., " 60... | Oct. 9... | Epithelioma of lip..... | Excised, Dr Buchanan's method..... | " " " " |
| K. R., " 50... | Nov. 19... | Scirrhus of mamma..... | Excised..... | Died..... |

The disease extended to the lung, and she died eight days after the operation. She also suffered from pleurisy.

Four Hydroceles.

| | | | | |
|---------------------|------------|-----------------------|--------------------------|---------------|
| W. M.P., aged 45... | Feb. 6... | Single hydrocele..... | Tapped and injected..... | Successful... |
| P. M.F., " 42... | May 22... | " " " " | " " one..... | " " " " |
| J. H., " 72... | June 22... | " " " " | Tapped..... | " " " " |
| R. M.F., " 42... | Nov. 11... | Single " " " " | " " and injected..... | " " " " |

One Case of Ligature of the Femoral Artery.

| | | | | |
|---------------------|------------|--|---------------|-----------|
| S. M.C., aged 19... | Dec. 12... | Traumatic aneurism of femoral artery at groin... | Ligature..... | Died..... |
|---------------------|------------|--|---------------|-----------|

*Eighteen Large Abscesses Opened.**Six Sections of Sinuses.*

Two Fistula in Ano and Two Fistula in Perineo.

One Case of Artificial Anus.

Three Cases of Excision of Hæmorrhoids.

VI.—ON A CASE OF PROLONGED UTERO GESTATION.

By ROBT. PARK, L.F.P.S.G., L.S.A., &c.

THE facts in this case are so clear and well defined that I consider it devolves upon me to lay them before the profession at once, whilst they are capable of verification.

On July 7th, 1873, I was called to visit Mrs C., 2 Southampton Row, Weymouth. She informed me that she had calculated upon being confined a month previously, and that about that time, having experienced pains, and had a "show," she had made the needful preparations, and had sent for her midwife. The pains had passed off, however, and the expected labour did not come on, owing to the midwife "not having tried the pains sufficiently!" Since then, had been daily expecting labour to come on; but as it didn't, and as her husband had returned home from sea after an absence of ten months, and was naturally surprised to see her in the condition in which she was, she thought it time she had medical advice concerning herself.

She is a tall, raw-boned woman, æt. 37, is plain looking, with narrow forehead, and angular features. Has had seven children and one miscarriage. Two of the children are dead, one having died during delivery, being a breech case, and the other at the age of four years of hydrocephalus. Has lived nearly all her life at Weymouth and Portland. Was a domestic servant previous to marriage, and had been in the situation from which she married for five years. Has been married for 15 years.

Her husband is a pensioned boatswain's mate, aged 38. Is a short, well-built, muscular man, being in height 5 ft. 6 in., and 20 stone weight. His features are in striking contrast to those of his wife, being well cut and rounded, with a broad forehead, and heavy under jaw.

She states that she last menstruated during the first week of August, 1872, and that Tuesday in the second week (the 13th) of that month was the last day on which she noticed anything. Her husband came home to her on the 15th, and remained with her a fortnight. Dates the com-

mencement of her pregnancy from the 15th. Has "felt differently" this time from what she did on former occasions. Her urine during the last month has deposited a copious brick dust sediment, her feet have begun to swell, and she has had uneasy pains in her loins and shooting down her thighs. So far as she can tell, she never exceeded the usual period of nine months in any former pregnancy. Finally, she avers most positively that since her marriage no man has ever had access to her except her husband, and that "if she had been messing about with other men," she knew better than to allow herself to go past the nine months!!

On examination, I found the abdomen presented most of the ordinary signs of pregnancy at full term. The foetal movements were visible, and the placental bruit was audible near the fundus on the left side. The os was open, and about the size of a shilling, and, so far as I could make out, the vertex was the presenting part. To gain time and relieve her bowels, the following was prescribed:—

R Dec. Aloes Co. ʒiij.

Spt. Juniperi Co. ʒiij.

Aq: Camph. *ad* ʒiij.

Capiat unciam ter die.

On the 11th I saw her again, and ascertained that, though no labour pains had come on, she had passed numerous clots. The os was dilated to the extent of a crown-piece, and I clearly made out that the head was coming down, though there was something strange about the presenting part, which I could not quite make out. I concluded that the head had been somewhat altered by pressure, there being apparently extremely little liquor amnii.

I prescribed the following for her:—

R P. Sodæ Bibor. ʒiii.

Liq. Sen. Dulc. ʒj.

Aq. *ad* ʒiij.

Capiat part 6 tam 6tis horis.

Early on the 13th I was sent for, and found the patient

in strong labour. The membranes had ruptured, or rather had been ruptured by a midwife about an hour before my arrival. *Exceedingly little had come away.* Examination with the right hand revealed a dilated os, and an ear presenting. As I could feel the ear with unusual facility, and as it occupied that part of the vagina usually occupied by the vertex, I was induced to examine her with the left hand. In this way I was enabled to ascertain that the foetal head was very much shortened *in its vertical diameter*, and that, in all probability, it was an anencephalic foetus which was about to be born.

As the parturient efforts were tumultuous, and the soft parts dry, I administered twelve minims tinct. opii., which seemed to act like magic in rendering the pains more rhythmical, and the soft parts dilatable. In less than an hour and a-half the poor woman was delivered of an anencephalous foetus, which, fortunately for her, bore most unmistakably the features of the father and the build of his frame. It was a male, and had died during the parturient process. The only difficulty experienced was with regard to the shoulders, which were of unusual dimensions. The placenta, which was very large but not degenerate, so far as the eye and the sense of touch could discern, was detached and expelled with ease. There was no flooding and no *after pains*; and the mother is making a satisfactory recovery.

The foetus weighed $8\frac{3}{4}$ lbs. Its muscular system was very highly developed. The length from the back of the heel to the prominence of the shoulder, the tape being carried along the dorsal surface, was $17\frac{1}{2}$ in. The girth of the chest under the armpits was 16 in. The breadth from shoulder to shoulder was $5\frac{3}{4}$ in., and the girth of the thigh in its middle was 8 inches. The neck was very short and muscular. The face was full, round, and oval, with heavy underjaw, and the features bore a striking resemblance to those of the father and two of the children who took after him.

It happens in the experience of most of us to meet with

women who have gone a week, a fortnight, or even a month beyond the time they calculated upon for their labour. As in most cases the husbands have been with them throughout the period of pregnancy, there has been no means of ascertaining whether the impression of the woman as to the date of her conception be correct or incorrect. We generally conclude that she has made a mistake in her reckoning. It is evident, however, that in this case such a conclusion would be unjust to the poor woman, and at variance with the facts.

So far as I have been able to learn there is no reason for doubting her story. Previous to her marriage she had been in domestic service here, and must have borne a good character, as is evidenced by the fact of her having been in her last situation for five years. She has been married for 15 years, and during that time her husband has never had any reason to doubt her fidelity; and he, being a shrewd man, and above his class in intelligence, would not be readily deceived. She, on the other hand, knowing this, and being somewhat "conceited" of him, seems to have taken special care to behave herself with propriety during his absence, so that there should be no pretence for questioning her honesty.

It will be noticed above, however, that she and he happen to be very dissimilar in features and in conformation of body. This dissimilarity has extended to the living children also, two of them being very like the father, and two very like the mother. It happened, fortunately for the latter, in the present instance, that the features and conformation of the foetus bore so striking a resemblance to those of the father, that no doubt *as to the paternity* was left upon my mind, nor on that of any one who took an interest in the case.

Assuming the mother's statements to be correct, then, and calculating from the 15th August, 1872, as the date of conception, which was just *two* days after the cessation of the catamenia, we find that the period of her gestation was 331 days, or eleven calendar months less two days, or

twelve lunar months all but five days, or 47 weeks and two days.

It will be observed that parturition occurred *exactly* eleven calendar months from the date of the last appearance of the catamenia.

The small quantity of liquor amnii is noticeable as bearing upon Rudolphi's theory as to the causation of the anencephalic monstrosity. And as bearing upon the same theory is the fact that the child which died at the age of four years, was born with, and died from, hydrocephalus.

The action of the borax is worthy of mention; and, in connection with its use in this case, the complete absence of after pains. It may be disputed whether labour would not have come on without it; but, on the other hand, it might be maintained that, had it not been given, the labour would not likely have come till five days later, which would have concurred with a menstrual epoch.

The most likely explanation of the prolonged duration of the pregnancy seems to be that the cephalic extremity being flat on the crown, and about the size of the palm of the hand, was incapable of being moulded, and so filling up and pressing equally upon the dilated neck of the womb. The deficient quantity of liquor amnii rather tended to increase than to lessen the obstacle to the progress of the labour.

A case in some respects analogous to this will be found described in the *British Medical Journal* of February 22, 1873. In it the duration of pregnancy was 350 days.

VII.—DR RUSSELL'S REPORT ON AN OUTBREAK OF ENTERIC FEVER CONNECTED WITH MILK-SUPPLY.

I HAVE received so many applications for copies of this Report, and it is so evidently necessary to preserve for future use all the facts concerning those outbreaks of enteric fever connected with milk-supply, that, even at this late date, I venture to publish it in this Journal. To Glasgow readers the story must be stale; but, as it appeared nowhere in full but in the Glasgow newspapers, to others the facts

cannot be so familiar. The relation of Zymotic disease to milk is one of the most important questions in etiology of the present day; and Dr Dougall's paper, in last number of this Journal, is the first attempt to explain on general principles the action of milk as a distributing medium. The report is given here exactly as originally presented, with the addition of a foot-note here and there. J. B. R.

*Report concerning a Remarkable Local Prevalence of Enteric Fever
in January, 1873.*

In my fortnightly report, dated 1st February, 1873, I stated that "a remarkable local prevalence of enteric fever in the Eastern District is at present under my observation, and may probably furnish us with some interesting facts for a future report."

The suburb of Parkhead, to the extreme east of the city boundary, retains the features of a country village, and neither in the character of its inhabitants nor of its buildings is it suggestive of the city. That portion of it to which this report specially refers lies to the south of the Great Eastern Road, comprising Dalmarnock Street, Burgher Street, McEwan Street, and Helenvale Street. These streets run out to the open fields, and are made up of cottages and tenements not more than two stories high, tenanted by weavers or their descendants,—comfortable, cleanly, well-living people.

There are no water closets in their houses: the combined ash-pit and privy are universal. The drainage is mostly surface, leading to the fields; at anyrate, there is no communication with a sewer system. The water supply is abundant, from Loch Katrine.

The occurrence of contagious fever of any kind in an epidemic form in the district described has never been observed by the department. During the entire year 1872, only five cases of fever were known to have occurred in the streets named. It was, therefore, somewhat startling to find about the middle of January many families suddenly attacked with enteric fever, and to discover, on house to

house visitation, evidences of a severe and distinctly localised outbreak of that fever, limited in duration to that month, and especially to the fortnight between the 8th and 21st.

The facts were suggestive of some common cause acting for a limited time on this limited area. The discovery of this cause was, of course, very desirable. I shall not trouble you with a history of the inquiry, which has been tedious, but merely state the result.

In the first place, I believe we have got a perfectly complete list of every case of fever in Parkhead and Westmuir since 1st November, 1872, made up by inquiry at every house in the district. I have seen a large proportion of the cases and inspected the houses myself. In November there were 8 cases—4 of typhus and 4 of enteric fever. In December there were 3 cases *at least* of enteric fever in two families, one of these was the family of a dairyman, and I say at least three cases, because, while one child in the family of this dairyman is admitted to have had "*gastric*" fever, it is almost certain that more than one had the disease, though in a mild form. This was the state of matters up to the end of 1872. In January, 1873, enteric fever broke out in 39 families, in which it attacked 53 individuals. In February we know of only two new cases, and those in families previously attacked. The explosive nature of this epidemic is evident from these figures.

In the course of my inquiry, I found that not only had enteric fever been in the family of this dairyman in December, but among those attacked in January were a daughter-in-law who lived next door, and her sister who lived at the other end of the same street. Following this clue, I found that every family in this street where the fever was got milk from the same dairyman. There were 10 families ill of enteric fever, and without exception they were customers of his.

Further, having ascertained the milk supply of all the families attacked in January, I found of the total 39 that 32 were supplied by the dairyman, and yielded 46 cases of fever,

while only 7 families were supplied elsewhere, and these yielded only 7 cases.

It certainly was a remarkable fact, and one hardly to be explained away as a mere accident, that having ascertained all the cases of fever without exception in a district, we should find that while one dairyman whom we shall call X., was associated with 46 cases, the name of only one other dairyman was mentioned twice, and that the remaining five cases were supplied from five distinct sources.

It might, however, be that X supplied such a proportion of the inhabitants as compared with other dairymen, that if fever broke out in the district at all, it was certain to seize his customers in much greater numbers.

On obtaining a list of the dairymen and milk-sellers in the whole of Parkhead and Westmuir, it was evident that the chances were very much in favour of other dairymen appearing in the position of Mr X. There were 12 sources of milk supply, and taking only those where cows were kept and no other milk sold, I found that while Mr X. sold the milk of 10 cows, his neighbouring dairymen, 8 in number, sold the milk of 64 cows. It is scarcely conceivable that any mere chance could bring Mr X. into such prominent relationship with enteric fever.

A still more exact test of the relation between Mr X. and the distribution of enteric fever was to find the source from which every family in the district obtained their milk, and so ascertain the proportion of each dairyman's customers attacked with fever. It seemed to me equally sound as a test, and not so laborious, to take the streets where the majority of the cases occurred, and ascertain how many customers each dairyman had in those streets. Burgher Street, Dalmarnock Street, Gray's Lane, M'Ewan Street, and Ravel Row, contained 24 out of the 39 families, and were dissociated in space and yet so short as to be subjected throughout to the action of similar local circumstances, so that every one residing therein would have an equal chance of being caught by an epidemic cause of local origin. The following is the result:—

In Burgher Street 28 families were supplied by Mr X., and out of these 10 were seized with enteric fever in January, and four had suspicious cases of sickness, while 43 families were supplied by other persons and not one of them had fever or a single suspicious case of disease.

In Dalmarnock Street 28 families were supplied by Mr X., and four of these had cases of fever, while 20 were supplied elsewhere, and only one of them had fever.

In Gray's Lane six families were supplied by Mr X., and four had cases of fever, while 20 were supplied elsewhere, and only one of them had fever.

In M'Ewan Street nine families were supplied by Mr X., and two had cases of fever, while nine were supplied elsewhere and had no fever.

In Ravel Row there are just 11 families, of whom only two were supplied by Mr X., and these were the only two families who had fever.

The summation of this milk-census is this, that in five streets where the milk supply of every family was ascertained, out of 73 families supplied by Mr X., 22 had fever, and out of 146 supplied elsewhere only two had fever.

Having thus stated the chief points in proof of the case against Mr X., one or two striking corroborative features of this outbreak may be remarked.

1st. Enteric fever in families supplied by Mr X. frequently attacked several members of the family, so that 32 families yielded 46 cases. In families supplied otherwise it occurred only in isolated cases as we usually see enteric fever in Glasgow.

2nd. The fever was much more fatal in the families supplied by Mr X. Out of these 46 cases there were 6 deaths, while there were no deaths in families supplied elsewhere.

3rd. In two families supplied by Mr X. we were told that the two individuals seized were the only members of the family who used that milk. In both cases it was used with porridge, while the others took sour-milk in one instance and syrup in the other.

4th. The families in Great Eastern Road, Chapel Terrace,

and New Road, having cases of fever and supplied by Mr X. where no milk census was taken, are scattered about quite capriciously over a considerable area, and yet they number 10 against 5 supplied elsewhere.

5th. We ascertained the date of sickness in all these cases, and of the 46 supplied by Mr X. 6 sickened in the first week of January, 17 in the second week, 14 in the third week, 9 in the fourth week, while of the 7 cases supplied elsewhere there is no such clustering together.

The period of incubation of enteric fever, *i.e.*, the interval which may elapse between the introduction of the poison into the system and its activity, may extend to three weeks. This carries us back to the end of December, when Mr X.'s family had enteric fever, when the germs of the disease on one or more occasions got into his milk, and were distributed to those unfortunate persons who were, one by one, attacked during the month of January.*

I regard this as an extreme illustration of what must frequently happen where the sale of articles of food is conducted in close connection with families with all their attendant ailments. Milk is, from its composition, a peculiarly favourable medium for the propagation of the germs of disease, and particularly of enteric fever. It is seldom that this fever is diffused by milk in circumstances which permit us to trace the disease home to the milk so clearly as in the Parkhead case; and it is very likely that many apparently inexplicable outbreaks of enteric fever in families are caused by milk, or even solid food, contaminated in the retail shops, especially among the poor.† It is a very common practice in all parts of the city for parties to live and rear families in rooms behind shops, through which often the sole access lies, and in which groceries, milk, provisions of all kinds, sweetmeats, fruit, &c., &c., are sold. These

* I have been asked how the germs of the disease got into the milk. The only additional fact which I can give is that the person who habitually milked the cows was the person who nursed the children. As stated already, Loch Katrine water alone is used, drawn from a tap in yard.

† I have a strong suspicion that an outbreak of enteric fever in Drygate, last autumn, was promoted by milk-supply; at anyrate, it prevailed chiefly among the customers of a dairyman who had that fever in his own family.

shops are "served" by one or both parents, or some grown-up child, and when infectious disease enters such a family it cannot fail to be the source of quite peculiar risk to the public. I have been so much impressed with this by a series of cases in point that I submitted the following three illustrations to Mr Lang, Procurator Fiscal, to ascertain what legal powers existed to deal with them:—

1st. "Provision shop served by mother of family, consisting of eight individuals living in back room, a lodger slept on a shake-down *in the shop*. Two of the children had enteric fever in the beginning of January, and the death of one of them drew our attention to the case. I put the alternative to the parties, either to shut the shop or to allow me to remove the family to the Reception House and Hospital, and after much hesitation the latter course was adopted."

2nd. "Shop for sale of groceries, including bread, butter, ham, 'potted head,' &c., similar construction to previous case, only back room much smaller and no back-door, occupied by man and wife and three children. The man had been ill of enteric fever for 25 days before we discovered the case. During all that time the excreta must have been carried through the shop in order to reach the midden by the close, and the shop was 'served' by the man's only nurse and attendant—his wife. I put the same alternative before this woman, instantly to shut the shop or to send her husband to hospital, and she adopted the former course."

3rd. "I am aware of a baker's shop doing a flourishing business, the proprietors live in a house of four apartments in direct communication with the shop. Two members of this family had small-pox, one dying after an illness of 15 days."

Mr Lang writes his opinion "that persons situated as described in the various instances given in your letter, have not 'proper lodging or accommodation.'" It will therefore be possible by this and other provisions of the "Public Health Act," to deal with such cases so as to save the poorer classes from the obvious dangers of contagious sickness in

such circumstances.* I have therefore issued, through Mr Macleod, to the Sanitary Inspectors an instruction "that systematic attention be paid to the health of all families living in the circumstances described, by a more routine visitation than from the character of the people and the locality might be thought necessary. Any case of infectious disease discovered must be specially and immediately reported to the medical officer. He wishes the greatest care to be taken not to injure the interests of the parties referred to by unnecessary publicity in the discharge of this duty; but at the sametime there is a very obvious danger to the public from their private sickness, arising from their mode of living, which quite warrants the interference of the department."

(Signed) JAS. B. RUSSELL.

VIII.—A NOTE ON ENCYSTED PLACENTA, *by* JOHN BRUNTON, M.A., M.D., L.F.P.S.G., *Councillor of the Obstetrical Society, London, &c., &c.*

RETENTION of the placenta, arising from contraction of the whole uterus round the placenta, or, as it is commonly called, encysted placenta, is often a very annoying condition to treat.

Frequently partial adhesion complicates the case.

Encysted placenta is usually found in cases where, in cranial presentations, the delivery of the body of the child has been rapid, and most of these cases are to be met with where the child is born before the arrival of the medical attendant. An ignorant nurse oftentimes stimulates the mother to excessive endeavours, or, finding the head of the child born, immediately seizes it and drags the infant into the world, without waiting for a natural pain.

* I am informed by the Board of Supervision, in acknowledging receipt of the above Report, that "They are of opinion that under Section 42 of the 'Public Health Act' the Local Authority are entitled to take action in such cases." Considerable misunderstanding exists as to the powers conferred by this Section, but it is evident that if the words "proper lodging or accommodation" embrace a consideration in the fullest sense of what is "proper" in relation to public safety, then the Local Authority have the most ample power to remove under warrant any person suffering from infectious disease, and situated in relation to the public as the family of a dairyman are.

Again, in breech or footling presentations it is often necessary to deliver the head of the child rapidly in order to save its life. The sudden evacuation of the uterus causes it to contract round the placenta, the cord only protruding from the constricted os.

There are other causes for closure of the os round the cord besides the one I have mentioned; but as I wish only to hint an additional method or aid to treatment of such cases, I do not intend to enter into a discussion of the whole subject. Having stated the principal cause, given a case of encysted placenta, friction over the abdomen, traction on the cord, administration of opium, ergot, &c., are mentioned as means to delivery of the placenta. In most cases these fail, and the medical attendant has to resort to the unpleasant procedure of introduction of the hand into the uterus.

I have often had to do it, and it is as unpleasant to the attendant as it is to patient and friends. Of course I deem it necessary in such cases, unless there is actual hemorrhage, to wait at least one hour, so that nature may have a fair opportunity to exert herself.

I was lately summoned to a confinement. By the time I got to the house, the child was born. After separation of the child, I proceeded in the usual way to remove the placenta. The uterine contraction was good, but the placenta would not move. Examination revealed encysted placenta. I made many endeavours to remove the placenta, and, an hour after the birth of the child, I was proceeding to do so by introduction of the hand into the uterus, when I thought that as the hand made cold by holding it in coldest water, and then rapidly dried and applied to the abdomen over the uterus, was so advantageous in inducing uterine contraction when post partum hemorrhage existed, so it might possibly be of service in encysted placenta by inducing sufficient fundal contraction to extrude the after-birth.

I cooled down my hand, applied it, and was surprised at the result—immediate extrusion of the placenta. I felt vexed I had not done so three quarters of an hour before.

More recently, in a case of narrow pelvis (ant. post. diameter $2\frac{1}{2}$ inches), labour was induced at 7 months; there was an arm presentation, and I turned and delivered as quickly as possible to save the child. The placenta became encysted and came away immediately when treated in the way described.

I do not know that I am stating anything new to the readers of this journal, but in our standard works on obstetrics, I find no mention of this aid to delivery in such cases. If it be useful to anyone I shall be pleased.

Reviews.

I.—A SYSTEM OF MIDWIFERY, INCLUDING THE DISEASES OF PREGNANCY AND THE PUERPERAL STATE. *By* WM. LEISHMAN, M.D., *Regius Professor of Midwifery in the University of Glasgow.* Glasgow: James Maclehose. 1873.

FOR a considerable period there has been almost a dearth of systematic treatises on obstetrics by English authors. We cannot call to mind a single addition to the literature of the subject in the form of a good text book, published during the last fifteen years. It may be that the chief obstetricians in this country are so deeply engaged in original research that they have no time for the laborious and irksome task of systematizing the continually accumulating facts and principles of their science. New editions of Churchill, and Tyler Smith's useful manuals (the latter, we believe, is out of print) have appeared. Good hand-books, also, such as those of Dr Meadows and Dr Milne, have been recently published. Ramsbotham is still a favourite author with many students and practitioners, but his science, if not his art, is considerably behind the age. The publication of Simpson's Lectures was looked forward to with interest, but they can never take the position of a systematic treatise. In this matter of text books our American brethren are ahead of us. Hodge's ponderous tome is a perfect encyclopædia of every thing connected with obstetrics. Bedford's work, though written in a style too jaunty and vivacious for our sober British taste, is not deficient in merit. Byford's

treatise, barring its English, has many really good points. In this glance, also, we should not omit the translation of Cazeaux's work, in which the ideas of the famous French obstetrician have been excellently clothed in English garb. It is, indeed, not to home, but to foreign authors that we have for some time back been indebted for systematic expositions of the science and art of midwifery. In these circumstances, if there was no absolutely clamant call for a new text book by an English writer, it was at all events no unworthy ambition which has prompted a Scottish University Professor to write a systematic work on the subject—a book in which the student could find all the recent accretions to the science, and the busy practitioner the latest improvements in the art, of midwifery. We do not know whether Dr Leishman was stimulated in his labours by the recollection that the most popular work on obstetrics in the last generation was written by a Glasgow Professor, who long worthily filled another chair in our Alma Mater. Burns' Midwifery, which did yeoman service in its day and generation, was not superseded by younger rivals till it reached about a dozen editions.

To write a thoroughly good text book is a far more difficult task than it seems. Everybody is ready to recognize and honour the genius required for original research. But to write a systematic treatise it would seem at first blush that a good knowledge of the subject, and a facile pen are the only pre-requisites. This is a great mistake. Such a book could be fluently written, and crammed with good information, and yet be essentially a bad text book. A good text book is necessarily in one aspect a work of art. To give each department of the subject its due prominence, and no more, to keep in check the tendency to hobbies, to say, not what will glorify the writer but what will inform the student, these are things which require an æsthetic sense of fitness and proportion with which every one is not gifted. Then, again, in such a subject as midwifery, the literature of which is being daily increased by numberless alleged improvements, suggestions, discoveries, and theories of all kinds, some useful, some of doubtful value, and others worthless, the author who wishes to embody in his work only what will stand the test of time, must be gifted with a sound judgment, a practical sagacity, partaking something of the nature of instinct. To say that Dr Leishman has throughout evinced the highest artistic faculty, or that he has always discriminated the true from

the false, would be to assert that he is impeccable. But we can safely say that his work, as a whole, is one that will materially enhance the reputation of its author, and that it is not unworthy of the Medical School of Glasgow.

In order to mark out the scope of his work, Dr Leishman at the outset informs us that he employs the word *midwifery* "in the more extended sense in which it is used by Rigby and other English authors, and not in the limited sense which is implied by the French *accouchement* and the German *Geburtshülfe*. It signifies, therefore, that science and art, which has for its object the management of woman and her offspring during pregnancy, labour, and the puerperal state." If Dr Leishman will again look over the table of contents of recent French and German works, he will find that their authors use their respective terms in a sense quite as extended as that which he himself assigns to their English equivalent. Indeed, some foreign writers embrace in their text books a description of topics which neither our author nor any English obstetrician would ever dream of including under the term "Midwifery." Thus, Hubert's *Cours d'Accouchement*, published in 1869, has actually a chapter specially devoted to "Baptism." Dr Leishman's arrangements of subjects does not materially differ from those of other standard works. His first chapter headed "Introductory," is a somewhat odd *mélange*, being partly historical, partly apologetic, and partly scientific. It includes *inter alia* a brief glance at the progress of the art, a vindication (and a very good one it is), of its practice by the male sex, a short account of the comparative anatomy of the pelvis, and generally of comparative parturition, a statement of the cause of the comparative difficulty of parturition in the human species, and finishes with the definition of midwifery to which we have already adverted. While on the subject of arrangement, we may add that we do not know on what principle Chapter II., headed "The Pelvis," is wound up by a disquisition on the mammary glands; or why the rules for the management of natural labour take precedence of a description of its mechanism. The chapters on the "Organs of generation" contain, among other things, a careful statement of the most recent observations of M. Robin and others on the minute structure of the uterus, and of the corpus luteum. Chapter V. discusses the physiology of menstruation and conception, and the author has very clearly stated the various theories in regard to the source of the catamenial discharge. He summarily rejects

on *a priori* physiological grounds the view of Coste that it is a transudation through the walls of the capillary vessels without involving a rupture of these vessels. The theory that there are permanent orifices for the escape of the blood, is one that at all events has never been verified. On the other hand, Pouchet's view that the mucous membrane of the uterus exfoliates at each menstrual period, is inconsistent equally with the appearance of the surface of the organ, and the composition of the discharge. Dr Leishman (we think, properly) inclines to the view of Kölliker and Robin, that the blood escapes from ruptured superficial capillaries. But since the present work was published, we observe that Dr Kundrat, of Vienna, has made public some instructing researches on the subject. He has carefully examined the uterine mucous membrane before, during and after menstruation, with the following result:—A remarkable change takes place at the menstrual period in the cells of the stroma and the vessels, as well as the epithelium of the glands and surface, which become dull in appearance and filled with fat granules. This fatty change, Kundrat states, preceded the hæmorrhage, and he believes that this degeneration and not congestion, is the cause of the flow. Kundrat's investigations, if they are verified, must also materially modify our view of the relation of menstruation to conception. He insists strongly on the fact, that the tumefaction of the mucous membrane, and the other changes in its structure precede by several days the discharge of the ovum—that, in fact, the uterus undergoes a process of preparation for receiving the ovum before the rupture of the Graafian vesicle. If the ovum is not fertilized it dies, and menstruation takes place. Supposing this view to be correct, it will, of course, be necessary to compute the period of gestation not from the last menstrual period, but from the one which would have succeeded it had impregnation not taken place.

In our short notice we cannot do more than glance at one or two topics discussed at length by Dr Leishman. His two chapters on the "Mechanism of Labour" are in all respects admirable, and we know of no text-book in any language, except, perhaps, the new French edition of Nægele, in which this part of the subject is treated with such clearness, fulness, and, especially, such thorough appreciation of the difficulties of the student. When we consider that the possibility of safe and effective operative interference entirely depends on the practitioner's knowledge of the mechanical principles of parturition, it is of the last

importance that his understanding of this part of the subject be clear and thorough. Coming to practical subjects, Dr Leishman discards the traditional support of the perineum, on the ground that such support necessarily implies opposition to the progress of the head. With the late Dr Tyler Smith (to whose opinion we observe that Dr Leishman, throughout his book, pays great, perhaps too great, deference), he believes that pressure upon the perineum is apt to excite the uterus to increased contraction by reflex action starting from the nerves of the perineum. If this be the case, pressure on this structure should be a means of exciting the action of the organ in cases of weak contractile power. We are not aware that there are any clinical observations to show that the uterus has ever been affected to increased energy by such a procedure.

The part of Dr Leishman's work, however, in which he has most exposed himself to hostile criticism is that on the forceps. We do not refer to the class of cases in which he would use it, though we greatly miss in his chapter on the instrument a good synopsis, or summary of these classes. Nor do we allude to the time at which he would use it, relatively we mean, to the strength of the patient. In a manual published in London, about a year or two ago, the rule is broadly laid down that the "forceps are applicable when the patient has become *exhausted*." Dr Leishman does not commit himself to any crudity of this kind, but in several instances he is somewhat vague and indefinite in regard to this important matter of the proper time for operative interference. But what has taken us somewhat by surprise is his teaching in regard to the kind of forceps to be used. For a writer on obstetrics now-a-days to avow a decided predilection for the straight variety must at all events argue some moral courage. Our disappointment is all the greater since Dr Leishman has in many other respects shown a healthy impatience of mere traditional teaching, and a determination to go to the roots of questions. There can be no doubt that nearly all the great obstetric authorities at home and abroad now agree in condemning the straight forceps. Barnes has lately emphatically put his elephantine foot on it. Dr Leishman, indeed, stands nearly alone in his admiration of the single curve. At page 521 he gives a drawing and a description of a straight forceps, of a length intermediate between the short and the long variety. This instrument he recommends "to young practitioners, who generally possess but one." Now the

kind of teaching on the subject for young practitioners and students which we would have expected from a teacher of the present day would be something like this: In order to acquire confidence, dexterity, and facility in the use of the forceps you should accustom yourself to the use of *one* instrument. The long forceps is an instrument of far greater power and range of application than the other, and it can be used in all cases (except for rotation of the head), in which the latter is applicable. The use of the curved instrument is a little more difficult to acquire than that of the other, but when you can use it, it is vastly more serviceable. From the first, then, habituate yourself to the use of the long forceps, with a pelvic curve, and of no other. Instead of this, here is practically what Dr Leishman says to young practitioners:—The straight variety, though not comparable to the other as a serviceable instrument, is at first more easily managed than the other; *therefore*, acquire its use. It is only fair, however, to allow Dr Leishman to give his reasons for this preference in his own words. “(1.) The blades of the straight variety are more easily introduced with reference to the position of the child’s head if the operator has but one curve to think of. (2.) The two blades being the same, no mistake can possibly be made between the upper and lower, or anterior or posterior blades. (3.) If it should be found necessary to alter the position of the head by rotation, this can only be effected by the straight instrument.” The last argument has perhaps some little validity, but the others have really none. It is surely not complimentary to the intelligence of any obstetric operator to assume as possible such vacuity of mind as is involved in the idea of his being puzzled with the two curves, or introducing the wrong blade. By the way, one of the chief objections to the single-curved instrument is this very matter of its introduction. To get in the upper blade the nates must be dragged over the edge of the bed, sometimes an inconvenient and difficult position to maintain. When to this is added the limited tractile and mechanical power of the instrument; that it is confessedly inapplicable in all cases in which the head is above the upper third of the pelvic cavity; that it is incapable of compressing and thus reducing the diameters of the head; that, as regards the mother, its use occasionally results in rupture of the perineum, bruising of the sciatic nerves, or of the urethra; and, as regards the child in compression and consequent paralysis of the *portio dura*; with all these disad-

vantages, we say, the wonder is that the instrument has not long ago become an archæological curiosity. A recent foreign writer says, with some truth, that though to this country is due the merit of inventing this noblest of all conservative instruments, yet it is here that its benefits have been least appreciated. This result, we believe, has been greatly caused by a bad style of instrument.

The chapters devoted to the diseases of the puerperal state strike us as being particularly good, but we cannot enter farther into the scientific merits of the work. Of its literary merits we can speak with unmixed praise. Dr Leishman has a fluent pen and a correct taste; he says what he has to say without any pretensions to fine writing, or straining for literary effect. At the same time his style, though simple and easy, is seldom bald, and is often very felicitous. He is particularly happy in his mode of making a *précis* of the statements of opposing doctrines, which he does briefly, without losing one iota of the essence of any of the conflicting theories. He has also a knack of presenting the most abstruse or recondite topics in a manner likely to interest. The illustrations are numerous, and have been skilfully executed. Some of the dissections have been made with great care. Many of the stock illustrations of other works have been discarded, and others substituted for them. The publisher has done his part in a manner altogether worthy of the high reputation of the Glasgow University press.

Dr Leishman's work starts with a fair field. It was written to supply a desideratum, and we will be much surprised if it does not fulfil the purpose of its author. We have said that it has its faults; several of them, we believe, are due to the fact that some parts of the book are the result rather of reading than of working; they have been distilled less in the alembic of personal experience than in that of book study. But taking it as a whole, we know of no work on obstetrics by an English author in which the student and the practitioner will find the information so full, so clear, and so completely abreast of the present state of our knowledge of the subject.

II.—AN INTRODUCTION TO THE STUDY OF CLINICAL MEDICINE : being a guide to the investigation of disease for the use of students. *By* OCTAVIUS STURGES, M.D., *Assistant Physician to the Westminster Hospital, &c.* London : Smith, Elder & Co. 1873.

“THERE are certain remarks and suggestions which, while they hardly fall within the province of set treatises, may yet be usefully interposed between the book description and the study of the living thing.” Such is the author’s plea for the present book. His method of supplying the want is somewhat novel. He presumes that the student knows what he has been taught systematically, and he professes to avoid rehearsals or condensations of all such knowledge. He aims at supplying a plan for the student’s inquiries, furnishing such directions as may aid him in this respect, or may save him from the fallacies incident to inexperience. There is something to be said for the method proposed, but the writer does not seem to us to be very happy in carrying it out. There are no doubt tables of directions which have the same uninviting aspect which such elaborate directions usually have, but the writer seems to us to have failed in some of the very points in which he ought to have been especially strong. The use of the thermometer, for example, as a clinical instrument, and the method of applying it, do not come strictly within the range of systematic instruction in medicine. Very little information, however, is given on this point, although the reader is told “not to forget the numerous avenues of fallacy open to him;” it would have been better to have told him how to use it correctly than to supply a vague warning with a hint or two of possible errors. Under the heading of the examination of the nervous system, reference is made to the test of tactile sensibility by the use of the compasses, but no precise directions are given for applying the test, or for estimating the value of the results. The special senses are put down to be tested, but no directions are given for carrying this out, although it is pre-eminently a matter which, being often or usually untouched by systematic writers, is apt to be particularly puzzling to a student. In the same way the *faeces* are enumerated for examination in certain cases as to the presence of gall stones, among other things, but on referring to the text there is no direction as to how to search for them, although this is just such a point as the scope of the book would seem to cover. In the case of the urine, the author deviates from his plan by giving, amongst others, a test for albumen, but, in doing so, he only mentions one process, and omits altogether the use of nitric acid in the cold urine, so that we think such an incomplete section

ought to have been omitted entirely. A feature in the book is the discussion of certain points in rather numerous and often lengthy foot-notes, which appear curiously out of place in a work of this character.

Although we cannot regard this book as in any sense a successful clinical manual, we readily admit that students might, in reading it over, gain some hints not usually given, which are well calculated to be of much service to them when beginning the interrogation of patients and the recording of cases.

III.—1. *LEHRBUCH DER HAUTKRANKHEITEN.* Von Dr ISIDOR NEUMANN. *Docent an der KK. Universität in Wien. Dritte Vermehrte Auflage.* Wien, 1873. Wilhelm Braumüller.

HANDBOOK OF SKIN DISEASES. By Dr ISIDOR NEUMANN. Third enlarged edition. pp. 560.

2. *ZUR KENNTNISS DER LYMPHGEFASSE DER HAUT DES MENSCHEN UND DER SAUGETHIERE.* Von Dr ISIDOR NEUMANN. Wien, 1873. Wilhelm Braumüller.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE LYMPHATICS OF THE SKIN IN MAN, AND IN THE MAMMALIA. By Dr ISIDOR NEUMANN. pp. 31.

3. *SKIN DISEASES; THEIR DESCRIPTION, PATHOLOGY, DIAGNOSIS, AND TREATMENT.* By TILBURY FOX, M.D. Third edition. Rewritten and enlarged. pp. 532. Henry Renshaw, 356 Strand, London. 1873.

4. *THE PATHOLOGY AND TREATMENT OF DISEASES OF THE SKIN.* By J. L. MILTON, *Senior Surgeon to St John's Hospital for Diseases of the Skin.* London: R. Hardwicke, 192 Piccadilly. 1872. pp. 348.

5. *A TREATISE ON DISEASES OF THE SKIN AND ITS APPENDAGES.* By AUSTIN MELDON, *Surgeon to Jervis Street Hospital, Dublin.* London: Longmans, Green, Reader & Dyer. 1872. pp. 270.

6. *ELEPHANTIASIS GRÆCORUM, OR TRUE LEPROSY.* By ROBERT LIVEING, A.M., M.D. Longmans, Green & Co. 1873. pp. 150.

THE volumes on diseases of the skin, which lie before us for review, are so numerous that it is quite impossible to give more than a passing notice of each. The works of Drs Neumann and Tilbury Fox fairly represent the modern views of German and English dermatologists, and, as each of these is now in its third edition, it must be admitted that the verdict of the profession with regard to them is favourable.

(1-2.) The work of Dr Neumann is very profusely illustrated, and the woodcuts are very excellent. As far as the practical departments are concerned, it is a mirror of the teaching of the Vienna School of Dermatology in general, and of Hebra, of whom Neumann was a distinguished pupil, in particular; although it is very defective in details with regard to the

diagnosis and treatment of some of the diseases discussed. The most valuable and original part of the volume, and which distinguishes it from most works on dermatology, is that which relates to the pathological anatomy of the diseases of the skin. This has been worked out with great care, and the author's remarks are all the more instructive, seeing that they are illustrated by woodcuts representing the changes which are observed on examining sections of the diseased structures with the microscope. From this it may be gathered that Dr Neumann has done good service to the cause of dermatology, and that his book is well worthy of taking an important place amongst the more recent literature of the subject of which it treats. His pamphlet on the anatomy and pathology of the lymphatic vessels of the skin is likewise a valuable one. In the injection of these vessels he made use of a modification of the Hyrtl-Teichmann method, and he arrived at the following results:—The skin is abundantly supplied with lymphatic vessels, which have distinct walls lined with flat epithelial cells, and there exist no communications between them and the so-called lymphatic spaces, or other interstices of the cutis, as is affirmed by some pathologists. In the cutis two distinct but communicating dense networks of vessels are recognized (which lie beneath the networks of capillary blood-vessels), the superficial layer consisting of finer vessels than the deep; and while the lymphatics of the subcutaneous cellular tissue are provided with valves, those of the cutis apparently have none. In addition, from these two networks, branches proceed to the papillæ, hair follicles, sudoriparous and sebaceous glands. Some interesting observations are added with regard to the alterations in the size and form of the vessels in various diseases, and the value of the communication is much enhanced by a number of beautifully executed woodcuts, illustrative of the points discussed in the text.

(3.) Dr Tilbury Fox's volume is a great improvement in almost every respect upon his former editions, although we by no means wish to disparage them. The third edition has been re-written, and is much enlarged. The general tendency amongst authors is to make each succeeding edition of their works larger and more elaborate than that which preceded it; and although we do not think that the volume is too lengthy or prolix, it might be well for the writer, when another edition is called for, as assuredly it will be, to beware of still further extension. For it must

be admitted that, as one's experience increases, there is often more need of the pruning knife, and of the suppression of former views, than of their further elaboration.

The classification adopted is an approximation to that which has for a good many years been adhered to at the Glasgow Dispensary for Skin Diseases, being based, as far as possible, upon the nature of the various affections. They are divided into 10 groups, viz. :—

1. Eruptions of the acute specific diseases.
2. Local inflammations.
3. Diathetic disorders.
4. Hypertrophic and atrophic diseases.
5. New formations.
6. Hæmorrhages.
7. Neuroses.
8. Pigmentary alterations.
9. Parasitic diseases.
10. Diseases of the glands and appendages.

After a few introductory chapters on the anatomy, pathology, etiology, general diagnosis, prognosis, and treatment of diseases of the skin in general, the author treats of individual diseases. The description of the various affections are, on the whole, faithfully drawn, while the treatment recommended is manifestly from the pen of one well versed in cutaneous therapeutics. Two new forms of disease are described under the names of fibroma fungoides and dysidrosis. The former is a variety of fibroma simplex, and differs from it principally in "the tendency to ulcerate, to rapid growth, and to vascularity." Several cases, illustrated by woodcuts, are cited, one of which was benefited by huge doses of iodide of potassium. The latter, the name of which signifies difficult perspiration, is characterized by the retention of sweat in the follicles, which distends them, and leads to congestion, to the formation of bullæ, to maceration of the epidermis, and to inflammation of the skin. As the author remarks, this disease bears the same relation to the sweat follicles as does acne to the sebaceous glands. Its etiology is obscure, but it is generally met with in patients labouring under nervous debility, who perspire too freely, and who are dyspeptic. The treatment consists in attention to the general health, the employment of diuretics and tonics, and the external use of soothing and astringent applications, with the occasional puncturing of the vesicles and bullæ. This chapter is well worthy of careful perusal.

We regret that we are unable to enter more fully into the merits of this work, which is carefully written, and profusely illustrated; but we have said enough to indicate that, in our opinion, it is calculated to add to the deservedly high reputation of the author, and to facilitate the study of affections of the skin.

(4.) Of Mr Milton's volume we have little to say. It may be useful to those who are well acquainted with diseases of the skin, if they are desirous of getting a hasty glimpse at the opinions of dermatologists as to the treatment of the various affections; but we cannot recommend it as a safe guide to the student. The classification adopted is that of Willan, which has by most authorities been laid aside as unsatisfactory, and, from a clinical point of view, misleading; there is much scepticism shown with regard to many well-established facts, such as the necessary dependence of the tinea upon the presence of fungous growths; and we are surprised to find that syphilitic affections are entirely ignored, as being "altogether unsuited to such a work." The illustrations are well executed, as well as photographic pictures of skin diseases generally are, but it is notorious that photography has hitherto yielded very unsatisfactory results in the delineation of cutaneous affections. Those who are desirous of knowing something of the late Mr Startin's treatment may refer to this volume with advantage.

(5.) The less we say of Mr Meldon's little volume the better. It is a crude and unsatisfactory production, and we cannot agree with the author in thinking he has rendered "more simple the study of cutaneous diseases." We regret this all the more, seeing that better things might have been expected from his pen; but we have good hopes that with more experience of this class of diseases, he may yet succeed in the production of a book which will secure for him an honourable position amongst the dermatologists of the day. And we trust that a more extended acquaintance with the labours of his cotemporaries may convince him of his error in supposing that "very slight progress has been made in the pathology and treatment" of diseases of the skin.

(6.) This little volume by Dr Liveing, being the Gulstonian Lectures for 1873, revised and enlarged, is well worthy of the attention of those who are interested in the subject of leprosy, as it gives in small bulk all that is really known with regard to this dreadful disease. It contains reports of

several cases which have been under the care of the author, and it may be worth mentioning that one of the patients whose case is reported is at present under treatment in Dr McCall Anderson's wards in the Royal Infirmary. Alas! the volume in question throws no new light upon treatment, and is therefore of more scientific than practical value.

IV.—TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON. Vol. XIV.
London: Longmans, Green & Co. 1873.

AMONG the many important papers presented in this new volume of the obstetric transactions, that by Dr J. Braxton Hicks, on the Anatomy of the Human Placenta specially arrests attention, both by its fulness and the comparative novelty of the views enunciated. From a very careful and extensive study of the placenta both by dissection and examination, he has been led to dispute the generally received sinus-system theory as propounded by Hunter, and supported by Reid and Goodsir. His counter theory may be thus shortly expressed in his own words,—“That from dissections early or late in pregnancy there is no evidence of the existence of such a system. That there is no blood normally in the intervillal space. That no openings from blood-vessels into that space exist. That the curling artery expends itself by its ramification into the decidua of each lobule.” Among those who dispute the sinus-system he instances Louth, Velpeau, Leiler, Coote, Radford, Ramsbotham, Millard, Noble, Adams, and Madge. According to the Hunterian or sinus-system, the maternal portion of the placenta is viewed by Carpenter as a large sac, formed by an extension or prolongation of the internal coat of the great uterine vessels. Against the foetal surface of this sac the vascular tufts of the chorion push themselves, so as to dip down into it, carrying before them a portion of its thin wall. The blood is conveyed into this sac by the curling arteries, which proceed from the arteries of the uterus, and it is returned by large short straight trunks which pass obliquely through the decidua and discharge their contents into the great uterine sinuses. The vascular tufts not unfrequently extend beyond the uterine surface of the placenta and dip down into the uterine sinuses where they are bathed in the maternal blood. Dr Hicks admits that, “under any arrangement there are to be found sinuses which are situated at the

line of separation, partly encroaching on the placental and partly on the uterine side, and not in the placenta strictly speaking; under either arrangement the villi, growing vigorously as they do, particularly towards full term, press in all directions and dip into inequalities or any yielding portion they find, and thus push into these sinuses." But it is as to the sinus-system of the placenta proper that Dr Hicks differs from Hunter and his followers, not admitting that the maternal blood is conveyed into its cavity through the open mouths of the curling arteries, but on the contrary maintaining from direct observation that the intervillal spaces have no blood in them at all, and that Hunter's apparently conclusive results by wax injections must have been due to the rupture of the delicate walls of the blood-vessels. The paper under consideration is both ably written and beautifully illustrated, but we cannot be expected all at once to set aside as deceptive the careful and repeated observations of such men as Hunter, Goodsir, and Reid.

In a paper communicated by Dr Matthews Duncan, the following statement occurs illustrative of what not unfrequently takes place in the course of pregnancy, the renewal of the liquor amnii after a considerable discharge of it:—"A medical friend of my own, in charge of a ward for disease of women in a great public institution, mistaking a pregnancy for an ovarian dropsy, set about the operation of paracentesis in the usual way, and only desisted after a large quantity of liquor amnii had been drawn off, admonished by the motions of the foetus striking against the canula. The woman and her child were none the worse of the operation. The uterus again enlarged, and pregnancy was continued for about a month afterwards."

There is a very ingenious communication by Charles E. Squarey, M.B., "On the causation of acquired flexions of the uterus and their pathology." The leading idea is that the direction of the uterine axis is determined by the pelvic axis, so that if the uterus be high in the pelvis its fundus looks slightly forwards, if low, slightly backwards, and if midway, upwards; and that anteflexions and retroflexions respectively are produced according to the position in which the uterus may, from any cause, happen to be when sudden pressure is brought to bear upon it from above. The paper gave rise to some discussion.

An interesting case is related by Dr Phillips, of Guy's Hospital, illustrating the possibility of largely dilating the female urethra under chloroform, without producing incon-

tinence of urine. We cannot take leave of this latest volume of the transactions without expressing a hope that it may be extensively read by the profession and stimulate to further scientific investigation.

V.—BODY AND MIND: An Inquiry into their Connection and Mutual Influences, specially in reference to Mental Disorders. An Enlarged and Revised Edition, to which are added, Psychological Essays. *By* HENRY MAUDSLEY, M.D., etc. London: Macmillan & Co. 1873.

AMONGST the weighty problems which meet us on all sides in this world, assuredly one of the most important, and, at the same time, most fascinating, is the relation between body and mind. What is the nature of the mysterious bond which unites matter and spirit? In what part of the body does the "*divinæ particula auræ*" dwell? in the pineal gland? in the whole brain—"that dome of thought, the palace of the mind?" or, being spiritual, is it even now confined to the body? What is the nature of mind? Is there a separable immaterial entity, for which this bodily framework, "*glorious in majesty*" as it is, is a mere envelope? or is mind simply a function of the brain, and thought the result of the action of nerve-cells, not otherwise essentially than that bile is a secretion of the liver, or gastric juice of the stomach? These are some of the questions which have arisen in the discussion of this problem, and have exercised the powers of some of the most acute intellects which this or bygone ages have produced.

In the group of modern thinkers who have distinguished themselves by their writings on these and cognate questions, Dr Maudsley deservedly holds an honourable place. The work on which his reputation as a mental philosopher, as well as a medical writer, was chiefly founded, is his "*Physiology and Pathology of the Human Mind*." In that treatise he has pursued his inquiries into mental science from a physiological point of view, and has endeavoured to establish its great superiority over the metaphysical method of investigation. This, confessedly, is travelling in the same direction as Bain, Spencer, Laycock, and Carpenter; but, besides, he has shed fresh light on the subject by a philosophical study of the mental phenomena presented by persons afflicted with insanity.

The earlier chapters of the volume before us embody in a condensed, and in some respects improved, form, the author's

views on mind, sound and unsound, contained in the work to which we have just referred. They were originally delivered by Dr Maudsley before the Royal College of Physicians in London, when he held the office of Gulstonian lecturer. Then there follows the lecture on "Conscience and Organization," delivered last year by the author at the opening of the Psychological Section of the British Medical Association, which produced so great an impression both at the meeting and since its publication in the journals. In addition, we have essays on "Hamlet," "Swedenborg," "The Theory of Vitality," and "The Limits of Philosophical Inquiry," published from time to time in different periodicals.

The subjects discussed are obviously very diversified; and some of them, such as the essays on Hamlet and Swedenborg, scarcely fall within the scope of a medical journal to consider. Let it suffice to say, regarding the former, that the writer's knowledge of psychology (like Dr Bucknill) admirably qualifies him for critically analysing the story of the "mad prince;" and that his dissertation is another testimony to the great dramatist's truthfulness to nature in his delineation of character; for he shows that the apparent inconsistencies in Hamlet's conduct are in perfect harmony with a philosophical conception of his mental constitution, and, indeed, are features by which it is completed and characterized.

While properly declining to endorse the extravagant estimate formed by Emerson of the powers of Emanuel Swedenborg,—who describes him as "one of the mastodons of literature. . . . A colossal soul, he lies abroad on his times, uncomprehended by them, and requires a long focal distance to be seen,"—Maudsley admits that he had many of the attributes of genius, even of a high order. He enters very fully into the evidences of his attack of insanity,* which occurred about the time when he began to lay claim to being a seer, and to having free intercourse with the spiritual world. No unprejudiced person who has read, and credits the narrative of Brockmer, in whose house Swedenborg stayed when his mental illness set in, can for a moment doubt that the illustrious visionary had an attack of acute mania at that time; and as little hesitation will the physician, familiar with the forms of mental disorder, have in concluding that though the excitement passed away,

* Given in detail in Mr White's work on Swedenborg, from which Dr Maudsley has largely derived the material for his essay.

hallucinations, chiefly of vision, persisted, and were systematized.

In his essay on "The Limits of Philosophical Inquiry," Dr Maudsley strongly deprecates being regarded as a Comtist. Thus, he says (page 314), "It is not a little hard upon those who now devote themselves to the patient interrogation of nature, by means of observation and experiment, that they should be counted, whether they will or not, ministers of the so-called Positive Philosophy, and disciples of him who is popularly considered the founder of that philosophy." And yet we are at a loss to see any essential difference between the views of the positivist and those expressed in Dr Maudsley's works; at least there is a remarkable parallelism between them. The former altogether repudiates the metaphysical. He acknowledges only matter and its forces. According to him, our researches should be restricted to the observation and study of phenomena, in order to find out the laws of their association, and to discover the one great law which comprehends the others. He also holds that all vital, including mental, manifestations are necessary physical results arising in particular organizations, in accordance with their structure and conformation, and that they proceed from special and more complex arrangements than those which produce chemical combinations.

As we have already seen, with like decision Maudsley rejects the old metaphysical mode of inquiring into the constitution of the mind by introspection, regarding it as insufficient and misleading, and holds that patient induction is the only reliable method of arriving at sound conclusions regarding its laws. In like manner, life and thought to him are the outcomes and highest transformations of the forces inherent in matter. And so, too, in other respects the correspondence could readily be shown, and will, indeed, appear in the course of after observations.

Maudsley regards the nerve-cell as the most exalted creation of nature. He holds that a larger amount of vital force is employed in its production than in that of any of the other tissues. Thus, at page 300, he says:—"As a great expenditure of force is needed to raise matter from the inorganic to the organic state, so a further greater expenditure is required to raise matter from a low organic to its highest organic condition. The nerve-cell is, so to say, the highest parasite which thus sucks up the life of the blood; and if the process of its decomposition were accurately observed, it

would be found that all the force which had been consumed by it in its upward transformation was given back to nature in its downward metamorphosis."

This, however, is entirely speculative. There is not a particle of proof that a larger amount of vital force is required in the creation and maintenance of a nerve-cell than of a blood-cell or hepatic cell. Each tissue simply abstracts from the blood the elements suited to maintain its own life, and we have no evidence that this is more difficult, or requires a greater expenditure of force, with one organic structure than another.

If life or vital force, as our author argues, be transformed and concentrated physical and chemical forces, we would expect that at the moment of death there would be an immediate and powerful manifestation of one or more of these lower forces. Is this so? Does any *sound* coming from the departed break the stillness of the death-chamber? Is its gloom dispelled by a sudden blaze of *light*? Is the sorrowing mother, holding her dying child's hand, convulsed by an *electric shock*? We need not answer. It is only when the *matter* of our bodies begins to undergo decomposition that chemical action, heat, and electricity, show themselves, and not directly when life ceases.

In the first chapter, after explaining the method of inquiry which he intends pursuing, to which we have already alluded, he begins the study of mind by a consideration of its humblest phenomena, both in man and the lower animals. He details first the results of the well-known experiments with decapitated frogs, which seem to indicate intelligence, but are now regarded by physiologists as simply the product of reflex action. Then he passes on to the class of secondary automatic acts—actions learned, perhaps, only after a careful process of education, and requiring the attention of the individual, but which, after long practice, are sometimes performed quite unconsciously, "the faculties of them being organized in the constitution of the nerve-centres, and they being then performed as reflex effects of an external stimulus." In the next stage he ascends to the sensori-motor or instinctive actions, which are accompanied by sensation, but without the intellectual perception of them by the mind. They are illustrated by the often-quoted results of the experiments by Flourens on the pigeon from which the cerebral hemispheres had been removed. Lastly, he reaches the supreme nerve-centres—the hemispherical ganglia—which minister to the highest functions of mind, namely,

intelligence, emotion, and will. The organic processes in which these functions are concerned are regarded as fundamentally the same as those in the lower centres. He makes the following remarks on this point:—"The impressions which are made there [highest centres] are the physiological conditions of *ideas*; the feeling of the ideas is *emotion*—for I hold emotion to mean the special sensibility of the vesicular neurine to ideas—the registration of them is *memory*; and the reaction to them is *volition*. *Attention* is the maintenance of the tension of an idea or a group of ideas—the keeping it before the mind; and *reflection* is the successive transference of energy from one to another of a series of ideas. We know not, and perhaps never shall know, what mind is; but we are nevertheless bound to investigate, in a scientific spirit, the laws of its functions, and to trace the resemblances which undoubtedly exist between them and the functions of lower nerve centres."

These views are illustrated by special reference to memory. The organic registrations of ideas, it is held, are never actually forgotten, "but endure while life lasts; no wave of oblivion can efface their characters." There is memory, he maintains, in every nerve-cell, and also in every organized particle of the body. And he enforces his argument by a reference to Mr Paget's philosophical views on pathology, in which, by a consideration of the manner in which the scar of a cut in a child's finger is perpetuated, and grows as the body grows, it is shown that the organic element remembers the change which it has suffered.

He very properly directs prominent attention to the important part the great motor centres for speech play in the operations of mind, especially in processes of thought. Yet we think his conception of the nature of that part is in some respects erroneous. The following passage contains the substance of his views on the question:—"Here, however, we come to another pregnant consideration: the acquired faculty of the educated motor centre is not only a necessary agency in the performance of a voluntary act, but I maintain that it positively enters as a mental element into the composition of the definite volition; that, in fact, the specific motor faculty not only acts downwards upon the motor nerves, thus executing the movement, but also *acts upwards upon the mind centres*,* thereby giving to consciousness the conception of the suitable movement—the appropriate motor intuition." Now, we freely grant that words,

* The italics are the reviewer's.

or their motor intuitions, are most intimately, probably essentially, concerned in the elaboration of thought. This is the view held by an important school of metaphysical writers, and comparatively lately it has been strongly supported by Max Müller in his "Science of Language." Where we think that Dr Maudsley errs is, in maintaining that motor intuitions ascend from the secondary to the supreme centres during processes of reasoning. This gives an importance to the functions of the former class of organs to which we hold they are not entitled. Nor is it necessary to suppose that subordinate organs, as the corpora striata—the organs in question—are, should be endowed with such functions. For it is more likely that, while the power of expressing language is gradually acquired through education by the great motor centres, words themselves are registered in the hemispherical ganglia, and arise *there* in consciousness in association with thought.

Passing from this question, the author next shows how large a share muscular movements have in the expression of the emotions, remarking that often a corresponding emotion will arise in the mind when the ordinary expression of it in the features has once been assumed. "Fix," says he, "the countenance in the pattern of a particular emotion—in a look of anger, of wonder, or of scorn—and the emotion whose appearance is thus imitated will not fail to be aroused."

Lastly, he dwells on the sympathies which the mind has with the chief organs of the body, and describes how special states of feeling are induced by their condition, even in a state of health. Strongly he insists on the important influence the organs of generation exert on the mental constitution; and he points out how large a portion of our ideas and feelings spring into existence on the occurrence of puberty. But we cannot help thinking that he goes too far when he says in an after part of the work (page 139), "Were man deprived of the instinct of propagation, and of all that mentally springs from it, I doubt not that most of the poetry and *perhaps all the moral feeling* would be cut out of his life."* Surely there are evidences of moral feeling in human nature both before the sexual passion arises and after it has passed away! It seems to us, also, that in the same connection his charge of extreme moral degradation against eunuchs is too sweeping. For it may be doubted if their conduct was really worse than what generally prevailed in the courts to which they

* The italics are the reviewer's.

were attached. And, at least, we have evidence in the Scriptures that they were not all depraved. For example, in Isaiah lvi. 4, it is stated "Thus saith the Lord unto the eunuchs that keep my Sabbaths, and choose the things that please me, and take hold of my covenant," etc. And in Acts viii. 27, we have the story of the eunuch "who had come to Jerusalem for to worship," and who was afterwards converted by the teaching of Philip.

Chapters II. and III. are of chief interest to the medical practitioner. They contain an excellent account of the various forms of insanity, especially in relation to pathological conditions of the different leading organs of the body. The powerful influence of a hereditary disposition to disease of the nervous system in determining insanity, or other of the neuroses, is dwelt on with due consideration of its importance. The tendency to sterility and ultimate extinction in families where the more severe neuroses, such as epilepsy and insanity affect several members, is held to lend support to the Darwinian theory, which, both here and in other parts of the treatise, is referred to with cordial approval. In illustration of the disposition to the dying out of such a family, the case of the innkeeper, related by the late Dr Morel, is quoted. In this instance the supposed moral depravity of an extreme kind in him was followed in the second generation by suicide, homicidal violence, and epilepsy in different members of his family, and in the third generation, by mania and extinction of the degenerate race. We think, however, that the author attempts to base too much on this and one or two similar cases. For, in the first instance, the case itself is incomplete, as the charge against the grandfather, that he decoyed nobles into his inn during the first French Revolution, and there robbed and murdered them, which was made by his daughter, was not proved at the trial, so that the foundation of his argument is insecure. And, secondly, while it is true that from various causes, such as seclusion in asylums, etc., the insane themselves, as a rule, die without issue, it is also certain that most of their relatives, in whom there is only a hereditary taint, get married; and should the new stock with which the alliance is formed be a healthy one, the offspring will probably have less tendency to neurotic disorder than the parent from whom the proclivity to it is derived. The disposition, then, in this case, is not to extinction of the family, but to elimination of the morbid element, and to restoration of the normal healthy condition. But if, on the contrary, the

union be formed with a member of a family in whom a similar hereditary taint exists, the result in their children may not improbably be an intensification of the special diathesis.

As might have been anticipated from the views held by the author on the relation of the intellectual powers to the brain, conscience is also regarded as directly dependent on organization. This conclusion is based partly on cases of insanity in which the moral sense is either congenitally deficient, or in which its absence and the manifestation of vices of character, such as lying, stealing, cheating, etc., constitute almost the sole evidences of insanity; but chiefly on a study of the criminal classes, or rather, on the facts and opinions regarding them published by the late Dr Thomson, surgeon to the Perth Penitentiary. This gentleman held that the habitual criminal is a morbid or degenerate variety of the race, and "he was mainly impressed with their extreme deficiency or perversion of moral feeling, the strength of the evil propensities of their nature, and their utter impracticability." He found, too, that most of them were born of parents whose lives had been spent in vice. Dr Maudsley therefore argues that the disposition to crime in the children of such parents is inherited; that they cheat, steal, lie, because their brains are so constructed that they cannot do otherwise. Observers, and even they themselves, suppose that their acts are voluntary, that their wills are free; but it is maintained that they really are not so; for behind the will is the tyrant structure, which determines their course and shapes their actions.

The doctrine of necessity, in fact, pervades the whole book. It is a painful and depressing belief. It is also calculated to check our efforts at the reformation of criminals, and is an apology for vice and crime. Indeed, logically, according to it, the punishment of criminals is cruel and indefensible; as all of us are merely machines constructed after somewhat different patterns, and are bound to act as our organization directs. There is no merit in the good, the bad deserve no blame. Cordially the author approves of the prayer of the Arabian philosopher, "Oh God! be kind to the wicked; to the good thou hast already been sufficiently kind in making them good."

However, it is only fair to Dr Maudsley to say that he admits that much may be done by education in correcting the vice of the constitution. But we should have liked that greater prominence had been given to this undeniable fact.

Even with respect to those wretched creatures who formed the subjects of Dr Thomson's observations, if they had been removed from their evil surroundings in early childhood, and subjected to a sound and judicious training, it is much more probable that they might never have deviated from the path of rectitude than that they would have walked in their fathers' footsteps. After all, then, is it necessary to have recourse to the supposition that there is a congenital defect in the little ones, which necessitates a course of crime by inexorable law. Is not the force of example in the plastic period of youth sufficient of itself to account for a manhood of crime? And does not the success of our ragged schools, our reformatories, our training ships, and more especially, our Scotch system of boarding out pauper children in country districts—through all of which means the youth are removed from the evil influences of their homes, and subjected to a healthy training, physical and mental—show that there is no insurmountable tendency to vice in the children, even though unquestionably a very large proportion of their parents were drunken and degraded, and belonged to the very dregs of the population.

In drawing our observations to a close, the thought occurs that the reader may ask, Does Dr Maudsley throw any light on the nature of mind? Assuredly not. He wisely says that that is beyond human power to find out. He maintains, however, as we have seen, that mind is a property of matter. That it is conditioned by matter and manifested through it is obvious enough; but that it is a simple property of matter we hold to be incapable of proof. In short, their relations to each other are a problem which will probably never be solved by unassisted reason. Here begins the sphere of faith; the sacred records alone throw light on the question; let us reverently receive the truth.

Though we have felt bound to object to some of the doctrines contained in this work, we are free, and it gives us pleasure, to pay our tribute of respect to the ability of its author. As a whole, it fully sustains his high reputation. Its style is admirably clear and forcible, and there are many passages of great beauty and power. It has also much practical value. The physician will acquire by its perusal comprehensive views of the relations of bodily organs to mental states, both in sanity and insanity; and, conversely, he will be instructed regarding the influence of the mind on the body in health as well as in disease.

- VI.—1. DEAFNESS AND DISEASES OF THE EAR; THE CAUSES AND TREATMENT, by J. P. PENNEFATHER, L.K.Q.C.P., &c., &c., *Surgeon to the Royal Dispensary for Ear Diseases.* pp. 171. London: Bailliere, Tindall & Cox. 1873.
2. THE CAUSES AND TREATMENT OF DEAFNESS, BEING A MANUAL OF AURAL SURGERY, &c., by JAMES KEENE, F.R.C.S., *Eng. (Exam.)*, M.R.C.P., *Lond.*, *Assistant Surgeon to the Central London Ophthalmic Hospital.* pp. 180. London: Hardwicke. 1873.
3. LECTURES ON DISEASES AND INJURIES OF THE EAR, *delivered at St George's Hospital*, by W. B. DALBY, F.R.C.S., M.B., *Cantab.*, *Aural Surgeon to the Hospital.* pp. 221. London: Churchill. 1873.
4. ZEHN WANDTAFELN ZUR ANATOMIE DES GEHOERORGANS ZUM GEBRAUCHE FÜR VORLESUNGEN UND ZUM STUDIUM DER ANATOMIE DES OHRES, HERAUSGEGEBEN VON PROFESSOR POLITZER, &c., &c. Wien: Braumüller. 1873.
5. UEBER DAS WESEN UND DIE HEILBARKEIT DER HAUFIGSTEN FORM PROGRESSIVER SCHWERHOERIGKEIT. UNTERSUCHUNGEN UND BEOBSACHTUNGEN, VON DR FR. E. WEBER-LIEL (Friedrich Eugen Weber), *Docent für Ohrenheilkunde a.d. Universität, &c.* pp. 205. Berlin: Hirschwald. 1873.
6. TRAITEMENT DES MALADIES DE L'OREILLE, *par le Dr A. COUSIN.* *Deuxième édition.* pp. 205. Paris. 1871.
7. TRAITE PARTIQUE DES MALADIES DE L'OREILLE, &c., *par le Dr C. MIOT, Professeur libre de Clinique et de Pathologie Spéciale.* pp. 464. Paris. 1871.
8. TRAITE THEORIQUE ET PRATIQUE DES MALADIES DE L'OREILLE ET DES ORGANES DE L'AUDITION, *par le docteur J. P. BONNAFONT.* *Deuxième édition.* Paris. 1873.

THE above works are the latest issued treating of the Science of Otology, and, in England, the only text-books published since the issue of Toynbee's celebrated work on "Diseases of the Ear" (1860). In making this statement, we do not mean to convey the impression that no other works have been issued in this country, since that time, bearing on the same subject. On the contrary we have had two, which are treatises rather than text-books, and which commend themselves to the student and practitioner of medicine for their clear, yet elaborate and exhaustive style; we refer here to the article on the Ear in Holmes' System of Surgery, and the supplement appended by the editor to the last edition of Toynbee's work (1868), both written by a gentleman who upholds the reputation gained by Toynbee for English aural surgery.

In proceeding to examine these more recent contributions, it is necessary, in justice to their authors, to regard them from somewhat different aspects. The English works

are designedly and admittedly text-books for the guidance of the student and general practitioner of medicine, and ought to be examined in the light of their requirements. On the other hand, the foreign publications, more especially those issuing from Vienna and Berlin, pre-suppose a special knowledge of this department of science, and are to be regarded from the stand point of the specialist.

(1.) We were favourably predisposed towards this volume by Mr Pennefather, because of the modest manner in which it was announced in the columns of our medical contemporaries. The pleasant anticipation, thus engendered, of having a book to notice and no fault to find, came to an untimely end after this fashion. The book opened in our hands quite accidentally at page 5, which is faced by a full-page illustration intended by artist and author, we suppose, to represent the "auricle," "membrane of the drum," "meatus auditorius externus," and ossicles. Had the author omitted to affix the names usually employed to designate the separate bones of which the ossicular chain is composed, we would have been quite at a loss to know what these monstrosities were intended to represent; what they *are* like we cannot say. We have not met with any thing in nature at all approaching to them in form. After examining the remaining illustrations in the volume—seven in number and full-page—we could scarcely make ourselves believe that a volume had been issued by an English house of good name, in this present year of grace with illustrations—save the mark—which would have almost disgraced the chap books of seventy years ago.

The book itself no more represents the Otology of the present day, of this or any other country, than Carey's "The Hammer for the Stone" (1611) represents the present state of knowledge concerning calculous diseases.

(2.) The volume by Mr Keene is a very creditable production; both publisher and author having executed their respective tasks thoroughly well. The illustrations are very fair, except the chromos of the membrana tympani, copied from Gruber, which lack the freshness of the originals. The letterpress, on toned paper, is beautifully clear, and this, coupled with the shorn edges which render the paper-knife unnecessary, adds to the pleasure of the reading, and causes us to thank the publisher for so far consulting our comfort and convenience.

The language in which the author expresses himself is judiciously chosen, the style precise, and the method in which

he treats his subject exhaustive ; but we think he has sacrificed too much to conciseness, forgetting, perhaps, that average students and practitioners who may consult his pages in some difficulty are ignorant of the whole subject of which the volume treats. The subject is considered in two parts, the first of which discusses the various methods and apparatus employed in the diagnosis and treatment of ear affections. The second deals with the special diseases of the organ giving rise to deafness usually designated "nervous," beginning with the external, and ending with those of the internal ear.

There are several points upon which we cannot agree with our author, but neither time nor space, in a journalistic sense, enables us to dwell upon them ; nor is this, on the whole, much to be regretted, for we think they are points upon which we could agree to differ.

Where we have so much general excellence we can heartily give the author our unqualified praise, and commend his handy and excellent little volume to the student and practitioner.

(3.) The admirable little volume by Mr Dalby, the accomplished aural surgeon to St George's Hospital, consists of eleven lectures delivered by him to his *clientèle* at that institution, an abstract of which, as our readers may remember, appeared in the pages of our contemporary the *Lancet*, in the latter half of last year.

With a modest aim, this work, the latest by the way issued by the English press on Aural Surgery, is happy in conception and pleasantly written ; further, it shows that its author is thoroughly *au fait* in his specialty. The subject of which the volume treats is handled in a terse style, and this, if we mistake not, will make it acceptable to the student and practitioner, who have a just horror of unnecessary details. For ourselves, we could have wished that the author had made his lectures more scientific in tone. We propose to notice some points in the volume before us, and, making them the basis of our remarks, to interest our readers in the subject which he handles so ably.

In Lecture I., there is given the notes of a case occurring in the hospital practice of the author, in which the patient had the whole auricle bitten off ; "after the wound had healed, I found, on testing the hearing, that it was not appreciably impaired for sounds proceeding from a point from the left side of the patient, but that the hearing of the right side" (the uninjured) "was slightly the better of the two

for sounds which proceeded from either in front of or behind him." A result which common every-day experience would lead us to expect. The question, how far the hearing power is impaired in man by the removal of the auricle, is one, the investigation of which has engaged the attention of many celebrated anatomists and aurists, from the time of Valsalva and Haller down to that of Toynbee, and was left undecided by their labours; nor does our author seem to have been more successful than his predecessors; a result which we fear will continue unaltered, so long at least as the investigation is surrounded by elements of uncertainty. Fortunately the solution of this question is one of scientific, rather than of practical interest, in which position we may be well content to leave it, so long as problems of greater value in Otology demand our attention.

That many eminent aurists in times gone past, among them Triquet and Itard, and not a few in the present time, (we do not include Mr Dalby among them), regard the auricle as non-essential to perfect hearing, is to be regretted, because such an expression of opinion from men of science contributes indirectly to the support of the foolish and pernicious practice of the *modiste*, who, regarding the auricle as a somewhat unnecessary and superfluous appendage detracting from personal beauty, does her utmost to hide it from the passing gaze, and succeeds in her efforts, with the result of causing that deformity of the auricle, and collapse of the cartilaginous meatus, confined exclusively to females over twenty-five or thirty years of age. In connection with the opinion to which we refer above, we are glad to notice that Voltolini in a recent number of the *Monatschrift für Ohrenheilk.*, asserts that the auricle consists of two concentric parabolas, reflecting the modulations of sound against the tragus; this established, nature is absolved from the implied accusation of unnecessary detail in her work!

We observe that our author is in favour of the simple and efficient means of illuminating the ear, universally used on the continent, and all but general in this country. Apart from the advantages which it possesses, its general adoption by the profession is in no slight degree owing to the celebrity and popularity of Von-Trötsch, by whom it was first brought into notice at the congress of German surgeons held in Paris in 1851. It is a mistake to say (as is often done) that it is the invention of that celebrated aural surgeon. For that we are indebted to one Hoffmann, a physician of Westphalia, who about 1846, invented and employed it in

the diagnosis and treatment of aural diseases, prior and unknown to the Würzburg Professor. Our author has overlooked the ingenious contrivance of Professor Lucæ of Berlin, whose plane mirror enables the operator to employ direct sun light, and thus to obtain a beautifully clear illumination under circumstances in which, for obvious reasons, the use of the concave spherical mirror is inadmissible. We think it not out of place, because of its importance, to correct here a rather common error that prevails among English surgical mechanicians, who consider the ordinary mirror used for laryngeal or rhinoscopic purposes, equally well adapted for aural work. Any one may satisfy himself that this is erroneous, who experiments with the laryngeal mirror of ordinary focal length, (they are usually the segment of a completed sphere having a geometrical centre at a radius of 3 feet; the focus being 18 inches) and the aural mirror manufactured by foreign instrument makers, the principal focus of which averages about 5 inches. While we admit that the former may be used in a pinch for illuminating the ear; with the latter alone, is it possible for average eyes to recognise the very delicate pathological changes which are to be found on the membrana tympani, in nearly every case of ear disease.

The Vulcanite Specula of Politzer meet with the approval of the author. This is as it should be, seeing that these possess all the advantages but one, and none of the drawbacks belonging to the more costly silver instruments. The exception to which we allude refers to the colour of the interior of Politzer's instruments, which absorbs the rays of light incident upon this surface. When the ingenuity of our instrument makers overcomes this single disadvantage, by coating the interior of the specula with some white non-metallic inexpensive substance, then the vulcanite instruments will be used to the exclusion of the silver ones. In the same chapter we find a notice of Löwenberg's method (*Berliner klinische Wochenschrift*, No. 9, 1872), for the removal of foreign bodies from the external meatus; this shows that our author is *au courant* with the recent literature of his subject. Why he omits notice of Clark's (of Boston), pneumatic method, we do not understand, for although of less practical value it is as ingenious in conception as the method of the distinguished Parisian surgeon.*

* We observe that the method of Löwenberg has undergone at the hands of Zaufal a severe test, with a perfectly satisfactory result (*Arch. für Ohrenheil., neue Folge* June, 1873).

In connection with this part of the subject, we have been particularly well pleased with the sensible remarks which our author makes on the removal of foreign bodies from the external auditory canal, and recommend them to the notice of general practitioners, especially to those of them who are given to poking in the ear for the removal of a foreign body which they believe to be there, not from personal knowledge, but from the incoherent statement of the excited patient or the friends. In no class of cases is the German proverb more applicable, "blinder Eifer shadet nur," which we may very freely translate—temper your zeal with discretion, and do nothing in the dark. The remarks at pages 24 and 22 on syringing the ears are worthy of being read in the same connection.

In Lecture II., the affections of the auricle and the meatus are considered in a thoroughly practical manner; we could have wished, however, for the author's opinion as to the relationship, denied by some and asserted by others to exist, between hematoma auris and insanity. With his remarks on furuncular inflammation of the external meatus, we do not entirely agree. He is of opinion that this disease owes its origin to constitutional rather than local causes. It better consists with our experience to regard it as more commonly arising from, or existing in, sympathy with tympanitis in one or other of its various forms. The judicious remarks which he makes on the necessity of careful dieting, and constitutional treatment in inflammatory affections of this canal meet with our approval.

In speaking of exostosis or hyperostosis, our author accepts Virchow's view as to the causation of this hypertrophy of the osseous tissue of the external meatus; a view, we may remark, which our own experience has verified. In connection with the removal of these growths from the canal, an operation, by the way, which must always be performed under great difficulty, we are glad to place on record here a case which has escaped our author's notice, reported by Bonnafont (*L' Union Médical*, May, 1868.) The patient had a bony growth occluding the external auditory canal causing deafness. Bonnafont, after denuding the bone of the soft structures by escharotics, perforated it, and thus permitting the sonorous undulations to reach the membrana tympani, re-established the function.

In this chapter, the short sketch of the anatomy and physiology of the ear is satisfactory, if brief. Our author limits the application of the term "catarrh" to diseases of the

middle ear accompanied by increased secretion. It would seem to us necessary that some general understanding should be arrived at concerning the meaning to be attached to this word, not only because of its ambiguity in an otological sense, but on account of the varied significations given to it by many eminent aurists, several of whom permit it to have a wider meaning than our author, and this, not without a fair amount of histological and pathological evidence to support their position (see Voltolini *Monatschrift für Ohrenheilk.*, 1871).

In Lecture III. (page 63), he describes the steps of the operation of Eustachian catheterism as usually practised in England. We have always considered this method of performing the operation, which we may term here for distinction, the English method, as one of great uncertainty, and difficult of comprehension by the student. On this account we are pleased to notice that Mr Dalby has described the method of Löwenberg, which, modified by Politzer—the Löwenberg-Politzer method—(*Zur Technik des Katheterismus der Ohrtrompete*, *Wien. Med. Presse*, 1872), is by far the more reliable method of performing this valuable operation, whether considered from a diagnostic or therapeutical stand-point. In a future edition of this work, for this reason, and the additional one that the steps of the operation are clearly defined, and easily comprehended and followed by the student, we would counsel the author to include in it a description of the Löwenberg-Politzer method, as well as that known as the Kramer-Bonnafont, which latter we have found a favourite with students, and by following the steps of which they succeed without difficulty in placing the beak of the catheter in the pharyngeal orifice of the Eustachian tube. The remarks on the diagnostic and therapeutic value of this operation are clear and concise, while the caution (given at page 65) to observe strict cleanliness in the instrument, rendered necessary on account of the frequency of cases in which the pharynx is affected by syphilitic disease, ought not to be forgotten, especially in dispensary practice, where the promiscuous use of the same instrument is unavoidable. In private practice this danger is easily guarded against; there the simple rule invariably followed, of giving to each patient a catheter, puts the chances of their infection in the manner hinted at beyond possibility.

In Lecture IV., we have a fair, not over hopeful, yet discriminating statement of the difficulties met with in the treatment of chronic mucous catarrh. It includes also an

account of the heroic, yet useful operation of parakentesis of the membrana tympani.

In Lectures V. and VI. purulent catarrh of the tympanum and perforations of the membrana tympani and their treatment are considered fully, and to our mind, satisfactorily. The morbid taste exhibited by some patients in the choice of a domestic remedy for the relief of their deafness, is exemplified in the page before us (p. 106), by the case of an "intelligent person" who poured urine into her ear! After this, black beetles, oil of vitriol *et hoc genus omne*, have some show of reason in their selection, when a mechanical cause for the deafness is assumed by the patient.

In Lecture VII., the subject of aural polypi is fully treated, and their microscopic structure illustrated by six beautiful plates. The remarks upon this troublesome complication of ear disease are exhaustive, and the necessity of after treatment, to ensure a radical cure dwelt upon. We could have wished for the author's opinion, based upon his experience, concerning the value of evulsion, as compared with excision of these growths, in shortening the after treatment of such cases.

In Lecture VIII., the fatal terminations of tympanic diseases are dwelt upon, and cases illustrative of cerebral abscess, meningitis, thrombosis, and pyæmia appended. There is also a short notice of trepanation of the mastoid process, an operation by the way, which in Germany and America at the present moment is exciting much interest, and is destined to play an important part in the treatment of such cases of ear disease.

In the following Lecture (IX.), the nervous affections of the labyrinth, causing deafness, receive notice, in connection with which, we here take the liberty of calling our readers' attention to an able paper in the last vol. of *Guy's Hospital Reports*, by Hinton, entitled, "On labyrinthine vertigo, sometimes called Ménière's disease," well worthy of careful reading.

Our author also considers this disease which forms the subject of Hinton's paper. In connection with this obscure affection of the labyrinth, it is a hopeful sign as well as an incentive to further investigations into the nature of the nerve lesion in the disease called after the celebrated French surgeon, to observe that the experiments of Flourens, Czermak, Goltz, and others in support of his pathological evidence (for which see *Gazette Médicale de Paris*, 1861), have been questioned by Löwenberg, and received a damaging

blow from the celebrated Professor of the University of Dorpat, (see Böttcher, *Kritische Bemerkungen u. neue Beiträge*, &c., Dorpat, 1872). In connection with the treatment of tinnitus depending upon nerve lesion, we do not feel surprised at the hopeless tone indulged in by the author. Still, as it has been shown (Politzer, *Ueber subjective Gehörsempfindungen*, Wien, *Wochenschr.* 1865), that this may depend upon affections of the labyrinth amenable to treatment, and (by Brenner *Electro-therapie*, &c., Leipzig, 1868, and Moos in *Arch., für Aug., u. Ohrenheilk.*, B.i., 1870), that electricity (constant current) is not without some good effects in cases beyond reach of ordinary means; we ought not to despair until we have exhausted this latter remedy, and found it of no effect. In connection with the subjective tinnitus produced by pathological changes in the bony canals adjacent to the cavity of the tympanum, we may mention, that we saw the section of a case in Vienna, the subject of which had suffered for many years from the most distressing noises in the ear, and failed in obtaining the smallest relief, after consulting the most eminent aural surgeons of the continent of Europe. Dying at last, examination of the temporal bone revealed the true cause of the unsuccessful treatment of the case and the patient's distress. An exostosis in the carotid canal, diminishing its calibre to one half and compressing the vessel, had given origin to the tinnitus which rendered life unbearable.

Lecture X., is devoted to deafness caused by inherited syphilis, with illustrative cases, and to the consideration of some obscure affections of the auditory apparatus. We hope these affections will become less obscure, as we attain to a more complete knowledge of the general and special influences at work in their causation.

The concluding lecture (XI.) is taken up with a full and exhaustive consideration of the relative merits of the two systems (Dactylological or finger method, and lip reading or so-called German system) adopted in the educational training of the deaf-mute. The German system is evidently, if we mistake not, our author's favourite; a system, we may remark, superior to the ancient fingering system, because at once more humane and more scientific in principle. On these grounds, we hope for the speedy general adoption of the lip or articulative method by every educational institution in the kingdom, in which deaf-mutes are trained. This lecture is particularly interesting and deserving of careful reading by our professional brethren, and even by non-professional

persons who are interested in the subject in any way, because of the full account which the author gives of the modern system of articulation or lip reading, and which Mr Van Praag and others prosecute with so much success.

In conclusion, we hope that we have succeeded in interesting our readers in Mr Dalby's volume. We cordially recommend it as a trustworthy guide in the treatment of the affections of the ear. The book is moderate in price, beautifully illustrated by wood-cuts, and got up in the Messrs Churchill's best style.

We now proceed to the examination of those books issuing from the foreign press, and which at the outset we indicated as demanding to be looked at from the stand-point of the specialist.

The pleasure which the examination of such books affords, is due to their elaborateness, and to the exhaustiveness with which they enter into every detail; excellencies which they owe in great part to the Continental University system, which fosters individual effort by its double professoriate and *privat-docent*. In Britain, where aural science depends for its existence to a large extent upon private means and single-handed effort, where, as a specialty, it is all but unrecognised in schools and hospitals, need we wonder if its literature suffers by this neglect. If we except the works of Saunders, Wilde, Toynbee, Hinton, and one or two others which, by the way, are not surpassed, if they are even approached, by anything produced in Continental Europe, we will search fruitlessly for works which can favourably compare in quality and numbers with the productions of the foreign press. Ours, characterised by a general knowledge of the subject, are wanting in excellencies to be found only in the works of our continental *confrères*.

(4.) The magnificent atlas of the organ of hearing, consisting of ten plates (each 70 Cm. by 57 Cm.), by the distinguished Professor of Otology in the University of Vienna, will add new lustre to his world-wide celebrity. Lithographed by the well-known Schleisinger after originals by Politzer, we have in their names a guarantee for beauty of execution in the workmanship, and anatomical accuracy and correctness of design.

We are especially pleased with plate IX., which is a "Schematische Darstellung des Cortischen Organs," according to Kölliker, Hensen, Waldeyer, Böttcher, Löwenberg, Nuel, Gottstein, Winiwarter, and Professor Politzer's own labours. The results of their investigations are shown at a

glance in this plate, and demonstrate the high degree of perfection to which this department of Otology has attained, by the labours of these eminent histologists. It were much to be wished that equally satisfactory results had been arrived at concerning the function of this organ. The uncertainty which attends the labours of the physiologist may yet be lessened by those of the pathologist, as they have been already in some degree by the labour of the comparative anatomist.*

In this plate, (IX.) the *membrana tentoria* is represented after Henle and Löwenberg, and not according to Kölliker and Böttcher, (the latter, however, have their views concerning the form and point of attachment of this membrane represented by a dotted line). We could not have expected otherwise, knowing as we do, that Politzer has by his own independent investigations confirmed the results arrived at by Henle and Löwenberg.

Plate X. consists of twelve typical representations of morbid changes occurring in the *membrana tympani*, to the accuracy of which, we can testify from our own experience. The figure representing this membrane abnormally concave is especially note-worthy, because of the marvellous accuracy with which the idea of excessive concavity is, by the united labours of author and artist, transferred to the paper.

The atlas supplies a want which Rüdinger's does not, although this latter has qualities of its own; a want which teachers of aural surgery must have experienced, and for supplying which they will thank Professor Politzer, to whom aural surgery is already so much indebted.

We cordially recommend it to lecturers and teachers not only of aural surgery, but of anatomy and physiology.

We had originally intended to have written of the remaining works in the prefixed list, but as they deserve more than a cursory notice, we must reserve our remarks for another occasion.

* Hasse has recently discovered, that the cochlea of birds contains no Corti's rods, but a membrane analagous to the *membrana basilaris* in the human organ. Helmholtz has thus been compelled to modify his view of the rôle which he considered the rods of Corti played in the function of hearing, and which he now assigns to the *membrana basilaris*; a position which pathology is tending to support. (See *Verhandl. des Naturhist. Med. Vereins zu Heidelberg B. v H. ii*).

VII.—A TREATISE ON PNEUMATIC ASPIRATION. By Dr GEORGE DIEULAFOY.
Smith, Elder & Co. London, 1873.

AN instrument for the extraction of morbid fluids from their various situations in the body has long been felt to be a want, and from the time of Galen, who is said to be the introducer of the first pyulcon, many instruments have been brought forward for this purpose. All of these were found to produce a *subsequent*, which from mechanical faults in construction was generally synonymous with an imperfect, vacuum. The innovation here claimed is the introduction of a *previous* vacuum.

Pneumatic aspiration, as it now stands, was applied to medicine for the first time by M. Dieulafoy, and made public in a paper written by that gentleman, and read by Professor Gaubler before the Academy of Medicine, Paris, on the 2nd November, 1869; and, though but three years have elapsed, that time has sufficed to spread it over the civilized world, and our periodical literature has for some time past teemed with the results of aspiration.

M. Dieulafoy employs aspiration not only as a means of treatment, but also as an aid to diagnosis. When a tumour presents itself in any part of the body of which the diagnosis by ordinary means is obscure, he proposes to settle by the aspirator whether it has solid or fluid contents. He believes that aspiration employed thus must necessarily be harmless, provided that ordinary attention be paid to the direction given by him, and he formulates his opinion on this point thus: "It is always possible, owing to aspiration, to search for a fluid collection without any danger, whatever be its seat or nature," and he hopes that our clinical knowledge may be advanced through aspiration revealing many pathological states, hitherto regarded lightly, but which, if we are able to establish a relation between cause and effect, may acquire the value of pathognomonic signs.

As a matter of treatment he proposes that when a fluid, whatever may be its nature, accumulates in a serous cavity or organ, and when these are accessible to our means of investigation without danger to the patient, our first care ought to be to aspirate the fluid, and should it re-accumulate re-aspirate it, and so on, over and over again, before resorting to irritants for the modification of the secretion. Should the amount of fluid in any morbid cavity be large, it would be detrimental to remove it all at once. Thus should chronic effusion of the pleura, a cyst or abscess in the liver present

itself, containing 1000 grammes of fluid, and were the whole of this quantity removed at once, it would convert the interior of the cavity itself into a kind of instrument of aspiration and so cause it to refill with fluid. Such a case should be subjected to repeated small aspirations, for instance 300 grammes at a time. By this gradual withdrawal of the fluid, the compressed and flattened organs are allowed to regain their normal situation and dimensions. No apprehension need be entertained regarding the repeated introduction of the needle, as its calibre is so fine that the aperture which it makes while penetrating the tissues can scarcely be discernible afterwards; and in many of the *post-mortem* examinations which have been made, no trace of the puncture could be discovered. When the punctures are made time after time within a short distance of each other, they produce a slight degree of inflammation; but this, in certain cases might even be desirable, in producing adhesions which would afterwards serve, as in cysts of the liver, to allow the introduction of a trocar if need be, for the purpose of washing out the cyst.

M. Dieulafoy then enters into minute details regarding the use of the aspirator in various diseased conditions, enumerating many cases in which aspiration has been tried. He first gives seven cases of hydatid cysts of the liver cured by this method. In some of these he describes what he terms a new symptom, which appeared immediately after the cyst had been aspirated, viz., the development of urticaria; and infers that there must be some relation between the hepatic lesion and the urticaria. In confirmation of the relation which sometimes exists between the liver and urticaria, we may mention that we have frequently seen, in the person of a gentleman well known to us, an urticarious eruption on the backs of his hands, during and sometime preceding a bilious attack, which remained there until the biliousness had subsided.

In retention of urine from mechanical obstruction in the urethra, aspiration is performed at the same locality as that chosen for suprapubic puncture. It is obvious that this operation must possess very great advantages over the old method of puncturing the bladder. We cannot agree with his remarks on using aspiration in place of the stomach-pump for emptying the contents of the stomach in cases of poisoning, except in very rare cases.

In cases of ovarian cysts one unilocular recovered, and one multilocular died, after aspiration.

Several cases of hydrocephalus have been aspirated, but all of these died shortly afterwards.

Two recoveries are reported from spina bifida.

Probably one of the most decided successes of aspiration has been achieved in cases of strangulated herniæ. 27 cases have been treated by aspiration. Of these, 20 cases which could not be reduced by taxis were, after aspiration, easily reduced, and recovered perfectly. Four cases had to undergo kelotomy, the aspiratory puncture not being sufficient to admit of the bowel returning. The three remaining cases are those in which, aspiration failing and kelotomy being performed, ended in death. This gives an average of 85 per cent. cured. These figures speak for themselves.

Other cases of disease are then treated at length, but they present nothing new.

M. Dieulafoy's volume contains a great deal of redundant matter and useless repetition: many sentences retaining the aspect of the original. At the outset there is an advancement of what his instrument has done for medicine, in the style of African Stanley; and throughout there is, perhaps, an over-sanguineness, which however is readily excusable. The volume, as a whole, is clearly written, is interesting, and contains much which will benefit the reader. Everyone who peruses it must be impressed with the fact that a great deal has been done by means of aspiration, and we look forward hopefully for still further extension of its use.

VIII.—THE MECHANISM OF THE OSSICLES OF THE EAR AND MEMBRANA TYMPANI. By H. HELMHOLTZ, *Professor of Physiology in the University of Berlin*. Translated by Albert H. Buck and Normand Smith. New York: William Wood & Co.

NOTWITHSTANDING the great advance which has been made of late years in the study of optics, and the application of the knowledge so gained to the diagnosis and treatment of defects of vision, little has been hitherto attempted towards a parallel application of acoustics to the consideration of the causes and treatment of deafness. Indeed, such an application has up to this time been extremely difficult, in consequence of the want of a full and satisfactory exposition of the mechanism of the middle ear, and more especially of the mode in which vibrations of sound are transmitted through the chain of small bones. At length, however, Professor Helmholtz has brought to bear upon the study of the pro-

blems connected with the ossicles of the ear, those rare qualities which have served to render him the most distinguished physiologist of the age, and has in the present essay rendered possible the foundation of a department of otology, which must ultimately become as important to it as the science of optics is to ophthalmology.

The first important conclusion the author arrives at is, that "the bones of the ear must be considered as solid levers, and the fluid of the labyrinth as a mass only to be moved as a whole." Edward Weber, in a paper published in 1851, propounded the same theory, but it did not receive general acceptance among physiologists, simply because it was believed that the joints between the malleus and incus, and the incus and stapes, would render such action of the ossicles impossible. Hence, a considerable space is here given to a minute description of the articular surfaces and ligaments of the malleo-incudal joint. It is shown that the articular surface of the incus is not simply saddle-shaped (as usually described), but that both the convex and concave surfaces have their edges produced into almost sharp ridges, the ridge at the lower border of the articulation being especially well marked, and fitting into a depression below the articular surface of the malleus. These ridges form cogs which become firmly fixed when the handle of the malleus is driven inwards, in which position therefore the malleus and incus will vibrate together, just as if they were one bone. On the other hand, when the membrana tympani is drawn outwards the head of the malleus will rotate on the articular surface of the incus, and the cogs will be disengaged. The author does not enter into the discussion of the advantages of a jointed chain of bones over the simple *columella auris* of birds and reptiles.

The anatomical description of the external meatus and membrana tympani is valuable for its minuteness and accuracy, although we question if students of anatomy will thoroughly appreciate the addition of another to the already too long list of what we may call "personal" titles. We refer to the "*Rivinian* recess," a minute fissure which is found in the upper part of the wall of the meatus, and which represents the last trace of the original visceral cleft. In the adult it is filled with loose connective tissue, and gives passage to vessels and nerves. Why not have called it the "lesser tympanic recess," or, perhaps, the "vascular fissure," either of which would have been better than its present title? With regard to the *processus gracilis*, we are

at one with the author in the belief that it is not a long process in the adult, and is not received into the fissure of Glasser; but that is not a sufficient reason for discarding the old title, and calling it the *processus Folianus*, a name which might with equal propriety be applied to the *processus brevis*.

We trust that, in a future essay, Professor Helmholtz will enter more fully into the question of the action of the small muscles connected with the ossicles, about which so much discussion has taken place. Of the *tensor tympani* he speaks thus:—"By the contraction of the single mass of elastic fibres constituting the tensor tympani (whose tension, besides, is variable, and may be adapted to the wants of the ear), all the inelastic tendinous ligaments of the ossicles are simultaneously put upon the stretch." And, on the same page, he mentions that, as long as the *rigor mortis* continues in that muscle, we shall find everything in the tympanum tense and unyielding. He seems, therefore, to admit the importance of its action, so that we are somewhat surprised to find him contented with repeating the suggestion of Politzer, that it acts during yawning. Of the stapedius muscle we can find no mention at all, although there is little doubt it has an important action on the stirrup, and greatly moderates the movements of that ossicle.

British physiologists are greatly indebted to Professor Helmholtz for the labour he has expended on this difficult subject, and to Messrs Buck and Normand Smith for the pains they have taken in translating this valuable essay into English, a work rendered extremely difficult by Helmholtz's condensed style of writing.

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- IX.—1. POPULATION: ITS LAW OF INCREASE, by NATHAN ALLEN, M.D., Lowell, Mass. Lowell. 1870.
2. PHYSICAL DEGENERACY, by the same. New York: Appleton & Co. 1870.
3. LESSONS ON POPULATION SUGGESTED BY GRECIAN AND ROMAN HISTORY, by the same. Boston. 1871.
4. DES FRAUDES DANS L'ACCOMPLISSEMENT DES FONCTIONS GENERATRICES, &c., &c., par L. P. E. BERGERET. Paris: Baillié et Fils. 1868.

IN the various pamphlets above enumerated, Dr Nathan Allen has endeavoured to show forth a cause, or rather a number of concurrent causes, tending to physical degeneracy, and indirectly to diminished population in New

England, and probably also in all the older settlements of the American Union. The facts brought to light are certainly curious, and may be even surprising to some of our readers. The theory adopted by Dr Allen may or may not be a complete explanation of the facts, but it is unquestionably one set forth upon no trivial grounds; and although we may probably think the author a little too easily satisfied as to some of his positions, it is impossible to deny him the attention due to all earnest efforts to discover truth. Furthermore, the views of Dr Allen have an interest beyond his own country, beyond even the present age of history. He finds, in fact, some of his leading illustrations in the history of Greece and Rome, as recently set forth by Professor Seeley; and he leaves us, in the end, in no doubt that we have either to reject his theory altogether as worthless, or to recognize it as being, more or less, a theory of world-wide application.

In a review in this *Journal* (August, 1869) of Mr Mill's well-known book on "The Subjection of Women," we have closely touched on the confines of Dr Allen's subject, though from a somewhat different point of view. We then insisted upon the importance of the physiological law of *sex*, as ruling, not only the physical, but the moral life of women in a way utterly inconsistent with the principles affirmed by Mr Mill; and we further remarked that the *family*, as the fundamental and absolutely essential unit of human society, must be regarded as the archetype of all really permanent and productive social organisations, so that whatever theory of "woman's rights" on the one hand, or practical assertion on the other of "the enfranchisement of women," opposes itself in any considerable degree to the family life, must be regarded as carrying with it the germs of decay, in respect that it is not a mere innovation, but a revolt against a law of nature; and in the case of the reforms advocated with such eloquence by Mr Mill we had no hesitation in thus characterising them, inasmuch as they proceed, one and all, on the principle that the original and (as we regard it) divinely ordered constitution of human society is to be subverted in favour of an assumed equality between men and women in all the relations of life, the family relation among the rest. Mr Mill freely admits, indeed, that this new principle of *equality* is opposed to all preceding social arrangements, and he arrives with equal frankness and decision at the conclusion that all existing social arrangements are wrong. We, on the other hand, con-

sidered it within our province to affirm that these, however imperfect or faulty in detail, had a very positive and indefeasible value as the expression of social facts of primary importance; and we argued that without any wish to degrade either sex below the level of the other, it was impossible to legislate on the principle of their *equality* in all respects, without striking at the root of the family relation, which in all its aspects, social, moral, and physical, implies and depends upon the essential physiological difference, and, therefore, inequality of the sexes. These views are illustrated by a reference to certain facts which seem to show that a desire for social "emancipation" in the female sex, when widely spread in a community, is usually accompanied by a corresponding impatience of domestic duties, and even by an unwillingness to encounter the first domestic duty of women—maternity. And accordingly, we concluded that the doctrines advocated by Mr Mill were not only physiologically unsound, but also, in the highest sense of the word, anti-social.

Dr Allen, without having had any cognizance, apparently, of the arguments of Mr Mill, and certainly without any more than casual reference even to the too notorious eccentricities of the "woman's rights" movement in his own country, has arrived at many conclusions with which we need scarcely say we heartily concur, when we give the following as a specimen:—

"The organisation of woman, the history of her diseases, and the rate of mortality, demonstrate that married life and the production of children are one of the primary objects of her creation. Physiology, pathology and all history upon the great laws of life and health prove this beyond controversy as a general law. There may be exceptions to this general rule, but it is a law which God has made applicable to all races and nations; and whatever institutions, habits, or practices, interfere with its execution, are abnormal, are deviations from the laws of nature and of God.

"By the great number of divorces occurring in this country, as well as from the increasing troubles in domestic life, it is quite evident that the laws of nature and of God, as here enjoined in marriage, are not very faithfully observed. Is there not good reason to believe that this institution is regarded too much at the present day by large numbers as a *mere partnership*, intended only for the comfort, convenience, and interests of the parties forming it? In attempting any reform here, should we not come back to first principles, the laws of nature?

"It is reported that there has been an alarming increase of vice and immorality in certain parts—especially in the large cities—of France and Germany, and it is found upon careful inquiry that these evils arise from breaking down the sacredness of the family institution, more than from any other source. Are there not agencies and influences operating here that in like manner threaten the security and permanency of this institution? The agitation which has sprung up within a few years with reference to the

wrongs, the rights, and the employments of women, presents questions complicated with domestic and public relations which are found most difficult and delicate to settle.

“ In the discussion of this great subject, and in the attempts to adjust the points of rights and duty involved, it becomes necessary to inquire what are the teachings of the laws of nature—the laws of life and health—not only of individuals—but *collectively of the race*? Here is a stand-point for canvassing this whole subject of vast importance. Any changes in the situation, employment, and position of women that shall tend to improve her general health, and perfect her physical organisation, are certainly above all things most desirable—not merely for her own sake, but on account of the relations she may sustain to others. The marriage and parental relations constitute the ground work, the foundation stones, the main pillars of all human society, and no changes should be countenanced or tolerated for a moment that tend in any way to weaken or destroy these relations. Admitting that the law of increase as here advocated is true, it presents new views of the highest importance as to all those means, influences, and agencies that are calculated to change the organisation and character of woman.”

We have begun with the preceding extract from Dr Allen's pamphlet on “Population and its Law of Increase,” published in 1870, in order to show at a glance where the author's ideas approximate most closely to our own. His discussion of the general “law of increase,” to which he attributes so much importance as to regard it in the light of a new discovery, presents so many points open to remark that we fear our limits will not allow of our following him in detail. But we shall endeavour to convey to our readers somewhat of the scope of a very ingenious, and, as we think, very valuable, if not in all points unassailable, argument.

Dr Allen opens with a reference to the well-known fact that the productiveness of the French people has, within the last half century, nearly reached the minimum point consistent with the preservation of the race:—

“ It seems from the census and registration reports of France, that the population of that great nation has become almost stationary, and that the number of births there has been steadily decreasing for the last fifty years. At the commencement of the present century the average number of children of each marriage in France was five, but it is estimated that the average number at the present day in the rural districts will not exceed three, and in Paris, not much over two. Now, it is a well-established fact that no nation can increase in population with a much less average than three children to each marriage. In confirmation of the same fact, it is found that the birth-rate in France has been reduced to one in thirty-seven persons. It is also an established fact that for any nation to be in a prosperous condition or gain in population, the birth-rate must range between one in thirty to thirty-five; but with a birth-rate less than that—say one in thirty-eight to forty, such a nation, having the usual amount of mortality, must diminish in population. The changes that have already taken place in France cannot be satisfactorily accounted for by the drafting of young men into the army, nor by the emigration of young people out of the country, nor by the diminu-

tion of marriages. If the births or birth-rate, therefore, should continue to decrease in France for the next fifty years, as they have for the last half-century, what will be the result?"

But if these are well-known, or, at least, admitted facts with respect to France, are there many of our readers prepared for the remark that a precisely similar phenomenon is to be observed in connection with the old Puritan stock of Massachusetts—consisting of some of the best blood of England, and, as regards its actual development in the past, certainly inferior in no degree to the best stock of the mother country? Hear Dr Allen on this subject.—

"By census returns taken in 1765 and 1865, there are now found only about one-half as many children under fifteen years of age, relatively to the adult population, as there were one hundred years ago. It is beginning to be admitted that there is at the present time, in most parts of New England, no increase of the strictly native population. This change is not at first very apparent, partly from the fact that a large foreign element is constantly immigrating to its shores, and partly, that this foreign class is wonderfully prolific, having nearly three times as many children as the Americans. This constant addition by immigration and births to the population of New England makes a fair show of increase on paper—but when an analysis is made of its character, it shows at once that all or nearly all this increase arises from foreign descent. If the average number of children among the Americans to each marriage should continue to decrease, so that they will not make good the places of the producing stock, and a larger and larger number of persons every year shall see fit to live a single life, it is evident that the *native* stock must rapidly diminish and, at no distant day, comparatively, *must run out!* Is it possible, says some one, that the Puritan—the best stock that the world ever saw, under what would be considered the best family training, the highest order of educational influences, and the purest religious instruction—should thus *run out* in New England, and give place to a people of foreign origin, with far less intelligence and a religion entirely different? When we come to consider all the causes of this radical change in New England population, it may not seem so surprising."

The argument is to some extent complicated, as the reader will observe, by the difficulty of determining exactly what is "native" and what is "foreign" population; but the statistics the author adduces from the census of the State of New York in 1865 give him the means of approximately dealing with this difficulty, and showing that "more than half the married women in the great State of New York average only one child and seven-tenths to each woman." Of course it is not easy to prove that this limited scale of productiveness refers *only* to the native American population, but Dr Allen shows distinctly as regards the county of New York—where the native and foreign population are about equal in amount—that "while nine hundred and sixty-five American women had each ten children and upwards"

(at the last census), "there were twenty-eight hundred and fifty foreign women" (*i.e.*, Irish, Scotch, English, and German), "having each ten children and upwards—making three times as many." Moreover, comparing the productiveness of the "strictly American" race, with that of the above-named races on their own native ground in Europe (but Dr Allen does not here give us the exact data on which he proceeds), he finds that the Teutonic, Saxon, and Celtic races above-named have two, if not three times as many children born to each woman as the "strictly American race." Finally, wherever the American stock can be compared overhead under advantageous conditions (as in Vermont in 1858) with the English stock in the mother country, the birth-rate is found to be very much lower—"in Vermont one to fifty-nine, in England, in the same year, one to thirty-one;" and if the foreign element were separated in Vermont (why not also the Irish element in England?) he holds that the disproportion would be still greater, and that perhaps the birth-rate in Vermont would be "only about one half as large as that of England."

There are several qualifications to be made before we can receive this last statement as a fair one under the circumstances; and, altogether, we must admit that Dr Allen does not manipulate his figures with the precision of an accomplished statist. In this country, for example, (taking England and Scotland together) it is notoriously the great towns that contribute most largely to the birth-rate, and this often in the midst of the most squalid and unnatural conditions of life; whereas, the population of Vermont is "a people occupying the healthiest part of New-England, engaged principally in agricultural pursuits, and scattered in settlement"—exactly the kind of population which in this country usually furnishes a *low*, and not a *high*, birth-rate. On the other hand, it is unquestionable that in this country the limited area of cultivation tends to drive the productive classes of the population into the towns, and thus leads to that curious phenomenon which the last two census exhibit as a progressive one, *viz.*, the increase of the urban at the expense of the rural population, to a degree probably unknown in America. The town-populations, in other words, have a high birth-rate relatively to the country at large for the same reason that has led to the great increase of their size, wealth, and material resources, *viz.*, the immense development of mechanical industries as compared with the stationary or diminishing demand for agricultural labour; a *natural selection*, so to speak, being thus created in favour of the towns, which

not only increase by immigration from the country, but tend to draw off from it precisely the kind of population which multiplies at the most rapid rate. But, whether Dr Allen's details, in the instance above referred to, can be sustained against these objections or not, we see no reason to doubt his main proposition, viz., that the strictly indigenous population of the United States is increasing at a very slow rate, if at all, and that the prodigious growth or overflow of population which we know to be taking place from year to year, especially in the Western States, is in a great degree composed of foreign elements. The moral of this tale is the more striking because, as Dr Allen has already remarked, the original Puritan stock of New England was notoriously a very productive one.

"The Puritans," he says, "were originally a prolific people. They had on an average for several successive generations from six to ten children to each married couple, but within the present century the average has dropped down from six to about three, and the birth-rate of the original stock in some cities has been even less than it is in France. Had not the older cities received recruits from the country or additions from the foreign element, their population would have been seriously affected."

In another place he says that, "by the census returns of 1765 and 1865, there are now found only about one-half as many children under fifteen years of age, relatively to the adult population, as there were one hundred years ago."

Such are the main facts which seem to Dr Allen to indicate a progressive deterioration in the fecundity of the American people, and to show forth the existence of some check to the so-called natural law of increase, not contemplated by Malthus in his well-known theory. Further evidence is adduced in a very striking pamphlet founded on Professor Seeley's researches, that both in Greece and Rome the development of luxury, and the progress even of civilisation (if civilisation is to be considered as synonymous with refinement and wealth of material resources) were attended by a precisely similar decrease in the productiveness of the native stock; and it is maintained, apparently on good grounds of evidence, that the fall of these two great empires was not so much the result of foreign conquest as of the pressure inwards of a foreign or barbaric element which, through the failure of the original or native population, came gradually to supplant and finally to overwhelm it. As the old Roman stock was slowly diminishing and dying out, the "*Græculus esuriens*" on the one hand, the Goth and the Vandal on the other, were pouring in upon the Imperial city, until in the end the empire was overthrown by its own tributaries. "*Men were wanting*" says Professor Seeley; "the empire perished for want of men. . . . To cultivate the fields, whole tribes were

borrowed. Want of population made it impossible to keep up a native army, and caused a perpetual stream of barbaric immigration. The barbarian occupied the Roman empire almost as the Anglo-Saxon is occupying North America; he settled and peopled, rather than conquered it."

The causes of this social phenomenon both in Rome and Greece, may be read in the pages of historians, poets, satirists. Polybius states them very plainly as regards Greece; Juvenal and Tacitus as regards Rome.

"*Saevior armis*

"*Luxuria incubuit, victumque ulciscitur orbem.*"

The following passage from Bishop Thirlwall conveys in few words the result of much thought and research, and seems to us more exactly comprehensive of the facts than even Professor Seeley's own expressions:—

"It is evident, on the whole, that the increase of population was not checked by oppression or by any calamity. The evil was not that the stream of population was violently absorbed, but that it flowed feebly, because there was an influence at work which tended to dry up the fountain head. Marriages were rare and unfruitful, through the prevalence of indifference, or aversion towards the duties and enjoyments of domestic life. The historian traces this unhealthy state of feeling to a taste for luxury and ostentation. But this explanation, which could only apply to the wealthy, seems by no means adequate to the result. The real cause struck deeper, and was much more widely spread. Described in general terms, it was a want of reverence for the order of nature, for the natural revelation of the will of God; and the sanction of infanticide was by no means the most destructive or the most loathsome form in which it manifested itself. This cancer had been for many generations eating into the life of Greece."

The great cause of the evil, in short, was sexual demoralisation; not in the form of prostitution and general libertinism only, but also in grave abuses of the married relation, which either directly neutralised its proper end, or at all events interposed obstacles to procreation, owing to the unwillingness of both parties to the contract to encounter the responsibilities necessarily arising out of the family life. Every one will easily perceive in the pages of Juvenal, and especially in the well-known and terrible sixth satire, how entirely applicable the description of Thirlwall, and particularly the latter part of it, was to Rome under the empire, as well as to Greece; how men jested with one another as to the proper way for a young man to "sow his wild oats," and the general tone of conversation went to condemn marriage as a supreme act of folly fit only for an idiot or a "common person;" how the women, rivalling the men in their passions, their occupations, their contempt for the cares of a household, were far more deliberate and far more per-

sistent than even the most degraded of the men, in the base conspiracy of the two sexes against the legitimate results of the law of sex—the *family*. And although we are not sufficiently versed in the obscenities of classical literature to interpret all the innuendoes, and throw aside the veil completely from these mysteries of iniquity, yet it is plain that, somehow or other, the purpose of marriage was in these days systematically defeated by the joint consent of the parties, and so a luxurious and vicious race became progressively more infertile, and the empire, defrauded of its contingent of citizens, was obliged to open its privileges to the foreigner.

At this point it becomes necessary for us to remark, though in doing so we may go possibly beyond anything directly affirmed by Dr Allen, that without attributing to the people of New England, or of the United States, the widespread and terrible corruptions of the Roman empire, it is sufficiently notorious that the indisposition of married women to bear children, or to nurse them when born, has probably led to a large amount of destruction of infant life in America. We hear, even in our author's carefully worded and modest pages, of "prudential considerations" which operate not only by postponing marriage, and imposing limits upon its natural prerogative, but "to such an extent has this 'prudence' been carried that a great variety of means has been adopted to prevent conception, and, in case of pregnancy, to produce abortion." We are told that this latter practice "has been carried on so extensively as somewhat to affect the increase of population," and that it is "prevalent in all classes of society—even with married women among the *intelligent, the refined, and the religious*." And when to these disclosures we add the fact that we have seen a cheap publication by the founder of the Oneida Creek community, discussing in the most open and shameless language, and *as a matter of religious obligation*, the various ways and means of "male continence," and advocating one which is practically identical with that adopted long ago by Onan—we have probably said enough to show that toleration is largely extended in America to forms of sexual aberration which would in this country be looked upon with simple horror and dismay by all classes of the population pretending to the least degree of respectability. That the author of the scandalous production above referred to has never been "lynched" on account of it, is proof presumptive that he has, in this respect, a considerable following beyond the limits of his sect. It is impossible, therefore, for us to follow with entire assent the observations of Dr Allen, in which he finds the chief cause of the infertility of American women in their altered

physical constitution. We believe, in short, that not the women only, but both sexes, are to blame, in different degrees, for the result; and that although physical constitution has probably something to do with it, moral causes have still more influence.

Be this as it may, the causes of the diminishing numbers of French families are by no means so very obscure. The compulsory subdivision of property among the members of the family by the code Napoléon has led, as one of its many injurious results in the agricultural districts, to a race of very small holders of real property, among whom large families are systematically discouraged, and who continue from generation to generation devoid of any adequate means for the support of a number of children. On the other hand, the luxurious habits, the self-indulgence, the deep-seated corruption and practical atheism of the towns has led to the widespread cultivation of forms of sexual immorality, the very names of which are happily unknown to the majority of the people in this country, and which could only be paralleled, if at all, out of that horribly licentious literature of the later Roman Empire, to which we have already referred. A little book by a provincial hospital physician, M. Bergeret, *Medecin en Chef de l'Hôpital d'Arbois* (Jura), is in our hands, and we do not believe that there exists a hospital physician in this country who could read it without amazement. And yet, if possibly an exaggerated, we believe it is an honest book. There is certainly nothing in the language to inspire misgivings as to the author's sincerity or earnestness. M. Bergeret deals with it as an unquestionable fact that in every part of France, in the most remote villages as well as in the largest towns, the *fruitful* performance of the generative act is systematically evaded, either through the determination of the male participant, or by collusion between him and the female; and this, in numberless instances, even in married life, though, of course, still more frequently in illicit connections. M. Bergeret explains, and at the same time protests against, these "frauds;" he discloses by multiplied instances their "dangers and inconveniencies for individuals, for the family, and for society;" he follows the disgusting subject into all its ramifications, and buttresses his arguments with such numbers of cases of varied and tragic interest that to read the book is to rise from it with a profoundly sad impression of utter amazement that any one man should have had such an experience. We are told of sexual intercourse carried on for years with a deliberate determination on both sides to take precautions against the usual result; of success in some cases, and accidental

failures in others, to the surprise of both parties; of health, virtue, self-respect, peace of mind, utterly ruined by persistence in this course; these evil consequences resulting in the majority of cases to the women, but in not a few instances to the men also. We are further told of very numerous cases, many of them occurring in married life, where the bad results above adverted to have been witnessed and the cause detected, and where the simple prescription, "*Je conseille une grossesse*," has entirely altered the whole complexion of the case, removed the sufferings mental and bodily, restored the ruined health, and put an end to a state of chronic distress and unnatural excitement endured under the deceitful guise of pleasure.

We shall give one extract only from this work of M. Bergeret, because we think it has a very distinct bearing on the questions raised by Dr Allen:—

"Les maris qui fraudent sont des hommes égoïstes, lâches, paresseux, qui ne veulent pas se donner l'embarras d'élever de nombreux enfants, afin de *jouir de la vie*, selon leur expression. Cet amour du confortable, des jouissances matérielles, entraîne souvent trop loin. La richesse publique, le bien-être général, se sont accrus dans une proportion énorme depuis un demi-siècle. Bienheureux étaient jadis les hommes qui, avec du travail et de l'ordre, arrivaient à pourvoir aux premières nécessités de la vie : aujourd'hui, quiconque veut travailler et avoir l'esprit d'économie est certain de voir ses sueurs largement récompensées. Mais, au lieu de s'en contenter, les désirs de l'homme, qui savent rarement se limiter, rêvent bientôt le superflu, chose si nécessaire. Pour avoir ce superflu, ce luxe, ces jouissances de la vanité, si convoitées, il ne faut pas avoir trop d'enfants à élever; c'est alors que l'on met en œuvre les fraudes. Mais ces rapprochements anormaux conduisent à des incidents qui viennent fréquemment jeter une perturbation profonde dans les familles; quoique le mari ait la conviction qu'il a pris parfaitement ses mesures, la femme devient enceinte, et la jalousie éclate, avec toutes ses fureurs."

Dr Allen holds that the women of New England, and of the United States, in so far as they have allowed themselves to be swept into the tide of luxury and refinement which constitute modern civilisation, are developing physical qualities less and less fitted for the great end of maternity. The predominance of the "nervous temperament" is a great cause of sterility or of few children.

"The brain and nervous system are exercised too much, compared with other parts of the body, and require for their support an undue proportion of nutrition and blood. In this class may be found some, especially women, who, commencing early in life, have been closely confined to books and literary pursuits; others, whose minds have always been kept under a severe pressure or strain from cares, anxieties, fashions, or excitements of some kind; others still, who, inheriting a decided nervous temperament, and neglecting physical exercise, live luxuriously, and depend for their enjoyment very much upon the excitements of the day. All such women have few children, and find much difficulty in rearing what they do have."

The causes of this excessive predominance of the nervous temperament, are stated by Dr Allen at such length that we can only follow him very briefly and imperfectly.

The first is, the diminished employment of the New England women in domestic labour, especially in the cities; no kind of exercise being so useful as this for developing a healthy and fertile organisation. The second error is the compression of the chest and abdomen by dress. The third is the strain upon the brain and nervous system from an early age at school, and in the acquisition of various refinements and accomplishments supposed indispensable in a high-class education. As a consequence of these errors, the brain and nerves attract relatively too much blood; the other vital organs being insufficiently supplied, become frail and delicate; the power of bearing and of nursing children suffers in proportion. Dr Allen holds that "not more than *one-half* of our American women now nurse their children. Some will not do it; others cannot, having neither the organs nor the nourishment requisite for it, and large numbers who attempt it, can furnish only a partial supply." Of course the only remedies for the errors here suggested consist in cultivating the opposite ways of living. In all this there is much general truth, and yet we cannot but say that in this part of his researches Dr Allen shows that he is easily satisfied with but little direct evidence. We do not doubt that all the evils he refers to are of more or less importance, but they are all only too common among ourselves to be in reality the main causes of that infecundity which, according to our author, so specially affects American women. We have a strong impression that in the preceding observations we have brought into view more clearly than Dr Allen the most probable sources of the evil. Short of the extreme practices insisted on by Bergeret, it may be said that every form of sexual irregularity, in proportion as it gains ground in a population, tends to defeat the first object of the sexual organisation; and everything that tends to withdraw one or other of the sexes from the natural mode of activity proper to that sex, will operate in the same direction, either by indisposing the persons so occupied to enter the married state, or by inducing them to avoid, when married, the procreation and rearing of a family. These remarks apply especially, of course, to the female sex; and, among the many interesting remarks made by Dr Allen in these pamphlets, there is none with which we sympathise more entirely than the following, on the growing instability of marriage in the United States as an

institution ; this being shown on the one hand by the unwillingness to enter the married state, and on the other by the increasing numbers of divorces :—

“ This decline in the marriage rate, and this growing instability of the institution, must have an influence upon the great question of population. Besides, if divorces continue to multiply as they have done for a few years past, this will certainly tend to weaken the relation, and make it more and more unstable. And there are agencies, if we mistake not, operating in society, some silently, others more publicly, that look strongly in this direction ; among which, some things uttered by the advocates of Woman's Rights, so called, should not escape notice. While it is admitted that woman has suffered many wrongs in society, and that there are good grounds for her greater improvement in health, employment, position, etc., we fear the manner and spirit with which her claims, together with the right of suffrage, are sought to be obtained, will have a tendency, in many cases, not only to prevent marriage, but directly and indirectly will be instrumental in *causing* numerous divorces. In fact, some of the leaders in this movement avow sentiments that are decidedly hostile to the sanctity and perpetuity of the marriage relation, and which, if practically carried out, would break up entirely the family institution.”

X.—1. A MANUAL OF ELEMENTARY CHEMISTRY, THEORETICAL AND PRACTICAL. *By* GEORGE FOWNES. *Revised by* HENRY WATTS. Eleventh edition. London: Churchill. 1873. 8vo., pp. 1026.

2. LESSONS IN ELEMENTARY CHEMISTRY. *By* HENRY E. ROSCOE. New edition. London: Macmillan. 1873. 12mo., pp. 488.

3. INTRODUCTION TO INORGANIC CHEMISTRY. *By* WILLIAM GEORGE VALENTIN. London: Churchill. 1872. 8vo., pp. 183.

THERE was a time when medicine was believed to be merely chemistry ; there was a later time when chemistry was believed to be mere medicine ; we may risk putting down the present as the time when they are believed to have no practical connection with each other. These different periods are reflected in their text books. In those of the first period, written by physicians, we see disease ascribed to disarranged chemical actions in the body ; in those of the second, written by pharmacists, the preparation of remedies for diseases is the chemist's aim and work ; in those of the third, written almost entirely by non-medical men, we see properties of matter examined without reference to their applications, or, if an allusion to technical use is made, medicine is not the art from which the illustration is drawn. Chemistry, in short, has an existence quite independent of medicine. Tradition, however, and a not very clearly defined notion that, as drugs are chemical substances, it may be as

well that a medical student should be taught what chemical substances are, still make chemistry part of a medical curriculum. It may be worth while, therefore, to state briefly what benefit a medical student may derive from a subject to which he is compelled to pay some attention. He may obtain some general scientific training: quickness and accuracy of observation, attention to details, and the habit of reasoning on observed phenomena; along with a knowledge of the general facts and principles of the science: the laws, which all forms of matter seem to obey, and a number of individual facts, chosen on account of their common occurrence, or of their wide influence, illustrative of them. This is the general or scientific part of a course of chemical instruction for medical students, the extent to which it is elaborated depending on the skill and judgment of the teacher. Further, he may and perhaps ought to obtain instruction and practice in those parts of the science which are especially applied to medical practice,—the chemical history of the substances employed in pharmacy, the proximate principles found in the body, the chemistry of physiological and pathological change. This should constitute the professional part of a medico-chemical course. At present in many places, or more correctly in most, the student never gets to the second stage, never to the part which would really interest him; and hence, too often he studies the first part with slight attention and with a certain grudge, not seeing what bearing it can have upon his profession.

Such an extended course as that described could be given only in a medical school, where students with different interests have not to be considered, and is almost unattainable at those places where the audience is a mixed one. Thus it happens that medical students—who form a large proportion of chemical classes, and whose interest in chemistry is as deep and wide as that of any section of students (unless it may be purely professional chemists), and much deeper and wider than of most—have to be content with such a view of the subject as suits everyone. This, indeed, is the only substitute for the completed course above specified, but then it is of the greatest moment to see that the general view is a view of the science, and not a repetition of the facts of chemical natural history. It must be confessed that at the present moment chief attention is devoted to the exposition and acquisition of facts, so called, so that while the student may be able to repeat all the preparations of the pharmacopœia from memory, he may be unable to give the *rationale* of any one

of them, or from a comprehensive knowledge of the science be able to devise or apply a different method to suit varied circumstances, or, when he afterwards enters into practice, to put a chemical problem in an intelligent way before a professional chemist. Chemistry—or, indeed, any science—studied in this way, is open to the objection which has been brought against the teaching of the classical languages; in which, instead of the languages being acquired so that anything written in them can be understood, single authors or a book of an author is learned, and when requested to read anything else the student is helpless, and in this way the value of linguistic training is obscured, and the teaching of these languages is depreciated. Similarly in the case of science, unless the acquisition of facts, on which the student usually seems willing to spend any amount of labour, is accompanied by constant exercise of the reason and judgment, the advantage of scientific teaching and training is in danger of being lost sight of. In the first instance the science must be an end to itself, afterwards it can be applied as is seen necessary or possible.

It must be confessed that partly as a consequence, partly as a cause, the numerous English text-books are to some extent to blame for defects in the study of chemistry. They are written too much from the natural history point of view, and theory, when introduced at all, contains too much speculative explanation, too little sound generalization; too much is said about the properties, too little about the functions, of bodies. Hence the student, led by his text-book, learns the facts, but misses a comprehensive insight into the science.

The list of books given above contains two of the most popular English manuals—manuals which have taken a place in front of all others, and for which there seems a never-ceasing demand. They are not written in the interests of medical students specially, but deal solely with chemistry as a science, so that they are suited only for the scientific as distinguished from the professional part of a medical course. The appearance of new editions of these works affords an opportunity for considering their merits.

(1.) The oldest of them is the manual of Fownes, a book which has gone through several phases, was for a long time the only student's manual in short compass, but was very nearly disappearing a few years ago. It was at the time when the change in notation was just becoming popular, and when a great demand arose for entirely new text-books. After some delay a modernized edition was got ready, but

from several causes, the work failed to regain the undisputed sway it once enjoyed. It was no longer the only textbook, others had entered into competition with it. The difference of bulk no doubt was against it, and in the rehabilitation a number of errors—trivial in themselves, but annoying by their frequency—were allowed to remain, which gave it an untrustworthy look. Nevertheless, it had several merits; the organic chemistry, as we pointed out on a previous occasion, was certainly the most modern review in English; the inorganic portion was recast to suit the most modern classification at that time of the elements; the chapters on chemical philosophy were rewritten, and a clear statement of equivalency and other theories was given; the newest discoveries in all departments of the science were recorded with suitable detail. Five years have elapsed and a new edition is again offered to chemical students. Its claims to wider recognition than the last are undoubtedly increased. Experience has shown that it is possible to make a textbook too concentrated; that what a student wants is rational insight into his subject, not condensed statements which require several years' study to verify and appreciate; and all this will possibly influence the demand for the new edition. But even on its own account it merits increased attention. In the midst of other work, the editor has managed to give the whole book a careful revision, and one can hardly read a page without observing changes. In the first place several parts have undergone curtailment, irrelevant matter has been removed, especially from the physics—and it seems to us an open question whether it would not be advisable to remove the purely physical part altogether and utilize the space in discussing chemical theory at greater length, or extending the very important section of animal chemistry. No one, we should imagine, would go to this book now to study electricity, when so many manuals on the subject can be got; whereas, medical students would certainly consult it for animal chemistry, if that department were elaborated in proportion to the others. The curtailment throughout the book is mainly in the description of less important bodies, and in disputed or doubtful matters; there is hardly anything of real interest which has been dropped. On the other hand, the additions, though in no case large, are numerous, and include most of the recent discoveries. Thus, in the organic part, considerable attention is given to the isomers of the alcohols of the fatty series, and of various members of the aromatic series; to the aniline colours; to artificial alizarine; to anthracene, and the

compounds got from it; to apomorphia, and to the new classification of the albumens and their congeners. All this can hardly be got in a short form in any other manual that has recently come under our notice. Changes there are of a different kind, but not less useful. For the first time we have the separation of the fatty and aromatic series, and there are several other transpositions which have been dictated by the necessity of having the whole of a subject together.

Altogether, then, this edition may be considered the most modern text-book in English; most modern in its information, most modern in its arrangement, and of value as containing chapters on general theory which, whether it be accepted or not, must at any rate be understood even by its opponents.

But while approving of the book, and especially acknowledging the efforts of the editor to make it really useful, there are several matters the alteration of which would in our opinion make the book better. There are some things changed for the worse. For instance, the table of coal-tar bases (p. 893) is not so good as that given in the last edition. Again, the exposition of the fact of definite composition is transferred to the opening of the description of the non-metallic elements. Now, while the transposition is an improvement, the exposition itself is marred; it is not so simple as that formerly given (see 10th edition, p. 237). This transposition, further, appears to us to indicate that a distinct enunciation of the laws of chemical combination must be given at the very outset, if the student is to understand the meaning of chemical reactions, as explained by current theory, and that therefore it would be advisable hereafter to rearrange the chapters on chemical philosophy. There are some things which we expected to see, but which we think are wanting; carbonic oxysulphide; the new processes for chlorine; a paragraph about nitrification; a drawing of the sulphuric acid chambers, not comparable perhaps with those in some French and German manuals, but—let us say—with that in Mr Bloxam's chemistry; a more compact statement of the tests for phosphoric acid than is given in previous editions. Of course there may be difference of opinion as to what should and what should not be admitted into the limited compass of a manual, and there are many points on which more information might be expected, but the above seem to be really omissions.

It is with considerable regret that, in this otherwise well got-up book, we notice several of the misprints of the previous edition retained. Thus the following pages—there

may be more—contain such repeated mistakes: p. 332, third line from the bottom, sulphuric for hydrochloric; p. 412, TiCl_3 for TiH_3 ; p. 445, $\text{SnF}_4 \cdot 2\text{KCl} \cdot \text{H}_2\text{O}$ for KF ; p. 520, line nine from bottom, hydrogen for nitrogen; p. 867, the reaction of a sulphocyanide with iron is described in an apparently contradictory way; p. 871, the formula of the melonides is several times misprinted; pp. 640 and 970, repeat discrepancy in the formula of chitin, and the account of urea is left apparently unfinished (p. 927).

If this were the proper place, several of the theories enunciated might be criticised. It must be remembered, however, that the editor cannot be held responsible for them, as his object has been rather to explain current views than either to discuss these, or advance views of his own. It may be remarked, however, that the whole atomic hypothesis requires thorough sifting—for in the hands of different chemists it is beginning to acquire as vague a character as phlogiston did in the last years of its existence. Some explanations again are hardly in keeping with the more recent theories—for instance, the action of nitric and of sulphuric acid on copper and on mercury. These flaws, however, are hardly visible in the work as a whole.

But there is one matter with the treatment of which we cannot at all agree. We refer to the shifting of names from one substance to another. Thus, the terms nitrous oxide and nitric oxide are applied to N_2O and N_2O_5 , although these bodies are already accurately, or, at least, distinctly denoted by the names nitrous and nitric anhydrides, while N_2O and N_2O_5 are called nitrogen monoxide and dioxide, with the additional information, within brackets, that these are sometimes called nitrous and nitric oxides. Now, so far as we know, these last names are not only *sometimes* applied to N_2O and N_2O_5 , but we have never found them applied to any other compounds of nitrogen in any treatise whatever, not even in Mr Watt's Dictionary. In a similar way, the term carbonic oxide, which is universally employed for CO , has been transferred to CO_2 , carbonic acid or carbonic anhydride, and the term carbonous oxide is given to CO . Again, the name hyposulphurous acid—involving the corresponding salts, the hyposulphites—which has been thoroughly established for the compound $\text{H}_2\text{S}_2\text{O}_3$, has been transferred to the compound H_2SO_2 . This, of course, necessitates the introduction of a new name for the better known commercial product, and *thiosulphuric*, a name sometimes given to the compound, but which has never met with general acceptance.

is what is substituted. We cannot see why the name *hydrosulphurous*, which was the original title, and is used in other principal text-books, was not retained for the compound H_2SO_2 .*

In point of practice the transference of names from one substance to another is quite wrong, and equally wrong is the forcible treatment to which the synonymous names are subjected. No synonyms, however exact, are ever equal in actual circulation; suddenly to desynonymize them, therefore, and to apply the name which has been universally used for one object to some new and unfamiliar object, is directly opposed to the whole system of language. In the particular instances the selection has been most unfortunate, for in them all the names of substances not only known in chemistry, but in various professions and manufactures, have been transferred to unimportant chemical bodies, while the names substituted are not likely to be adopted by manufacturers and others.

We should have thought that the confusion still existing in connection with the nomenclature of the mercury compounds—although it was due to a different cause—would have been sufficient to prevent tampering with established nomenclature. But supposing the transference permitted, we do not see gain in increased precision or regularity. The confusion is unredeemed by any advantage which would make it worth while to forget the former names and learn the new. If the names are considered to be defective, we should prefer seeing the whole series discarded, and entirely new substituted, but the transference of names should not be countenanced. For this cause, we cannot recommend the work to the student with the cordiality which it otherwise deserves. Whoever acquires the science from it will have to unlearn the nomenclature of a most important class of compounds, before he can consult other text-books and the larger treatises, or else be content to remain in continual doubt as to what body a writer means when describing nitrous oxide and hyposulphite of soda. The only remedy is to avoid the confusion, and adhere to the acknowledged system.

(2.) There are very few chemical manuals which have had as rapid and as great a success as Professor Roscoe's Ele-

* Doubtless the term hydrosulphurous is against analogy, if that be the reason for discarding it; the hydro-acids contain no oxygen, HCl , HBr , H_2S , &c. Now, as H_2S is called hydrosulphuric acid, hydrosulphurous should be a compound containing less sulphur than H_2S , and not H_2SO_2 . But it is better to have a name against analogy, yet quite precise, than a systematic name of which one cannot be sure of the meaning.

mentary Lessons. That it has been very widely adopted for teaching is a surer proof of its merit than the commendations of critics, and a review of it at the present day may be deemed superfluous. But as in this new edition the author has seen fit to make some alterations, he appears to consider that the book is not yet perfect, and others therefore may be permitted to share in his opinion. In this edition improvements have been effected by slight transpositions, as in the case of the paragraphs on combining weight and specific gravity. Additions of considerable extent have been made in the descriptive part, especially under the head of organic chemistry, and a few in the theoretical. The latter, however, are of such a kind that we should have preferred to see, instead of them, an explanation of chemical nomenclature, the principle of which the student is left at present to find out for himself. This is of all the greater importance that names are used in some places of which no explanation is given: a serious drawback in an elementary book, where everything ought to be as clear and definite as possible.

Indeed, if these lessons labour under any general defect it is that they are not elementary. There is too much told the student about facts which he is to remember, too little about the general aspects of the facts, about their points of likeness and unlikeness, and when any theoretical or general question is discussed at all, it is in a manner which requires for its comprehension and critical appreciation a much wider and more mature acquaintance with the science than can be got from the rest of the text-book. There is, therefore, a want of proportion in the amount of space devoted to different topics. Thus the section on the general character of the compounds of the metals and non-metals, which might have been made so useful and instructive to the student, is cut down to four pages, while the highly hypothetical doctrines about atoms and molecules, bonds and equivalency, quite incomprehensible and of very little value to the student, who has not been informed of the origin, scope, and significance of the verbal terminations "ous" and "ic," occupy no less than eight. In sixteen pages devoted to the composition and physical properties of water, the cheap production of ice being thought of so much importance that a drawing of the apparatus employed, occupying half a page, is given,* not a word is said about its chemical properties and functions. One of the most im-

* Indeed there are practically two drawings, for in the chapter on ammonia another page and a half are devoted to the manufacture of ice.

portant steps in the theory of acids was the discovery, by the late Mr Graham, of the cause of the different reactions of phosphoric acid, which he showed was due to three states of hydration. The peculiarity presents considerable difficulty to beginners, but when properly explained and illustrated it is very soon understood and remembered. But in this book nothing direct is said about the connection between phosphoric anhydride and the meta and pyro-acids, nothing to impress the student's attention with the fact that one combining proportion of phosphoric anhydride can combine with one, two or three combining proportions of water, and that in that respect the anhydride is a very remarkable body—nothing but a statement of experimental results, which in their modern shape appear to have lost the very essence of Graham's explanation. The modern classification of the elements, in which the arbitrary distinction of metal and non-metal is done away with, which is the clearest and simplest for most purposes, and at once fixes the student's attention, which is the most striking outcome of the recent modifications in the combining weights and promises many discoveries, is dismissed with the remark that "the singular relations which here present themselves can scarcely be the result of chance, but we are as yet unable satisfactorily to account for them," while the occult condition usually termed *nascent*, is accounted for by hypothesis upon hypothesis, and that twice over in the book.

This desire to account for a phenomenon leads sometimes only to unsatisfactory vagueness of language. For instance, chloride of nitrogen is said to be a compound in which the constituents are loosely combined, and therefore it explodes. It occurs to one to ask how the looseness of combination is made known except by the explosion, and how therefore the explosion can be caused by it? In other cases the language wants the precision which accompanies clear ideas. Thus it is said that "the sixty-three elements constitute the material out of which the whole fabric of the science is built; every description of matter which has been examined is made up of these elements, either combined together to form compounds or in the uncombined or free state." There is in this passage an identification of an abstraction—the science of chemistry—with the material universe, which, when one reflects upon it, is, to say the least of it, somewhat bewildering.

But if these, and some other matters on which we do

not quite agree with the author, be left out of view, it must be allowed that the book otherwise is very good. The amount of information packed into it, and very good information too, is large, and this is probably one cause of its popularity. The student finds it a very suitable book to "read up" for examination, as he phrases it, his aim being not knowledge of the subject, but successful passing of the examination. But in this very way the merit of the book is apt to be misused, and an examiner need not be surprised to find a candidate able to repeat pages of the book from memory, but unable to state what and of what kind is the reaction between protochloride of tin and corrosive sublimate, or between sulphuretted hydrogen and sesquichloride of iron. Such a state of things can only be modified by examinations becoming a test of skill and not of knowledge, and by text books condescending to address other mental faculties than the memory.

(3.) This attempt has been made to a certain extent by Mr Valentin. His "introduction" is the first part of a previous work, enlarged and improved and now published separately. It was originally designed for teaching the elements of the science by a hundred experiments, so chosen as to exhibit the commoner and more important reactions, and thus to lay an experimental foundation for the study of qualitative analysis as described in the second division of the treatise. In this edition the experiments amount to 169, and the text has been extended by a fuller treatment of the reactions and properties from 128 to 183 pages. The material is drawn from the non-metallic elements, their more important reactions being employed to illustrate the laws of combination by weight and volume; the atomic theory, in its most recent form, that of structure, with graphic formulæ to correspond; compound radicals; oxidation and reduction; the nature of anhydrides, acids, bases, hydrates, salts simple and double, characters of groups of salts, and other compounds; transformation of bodies into different states; general forms of chemical change.

From this it will be seen that the writer's aim has not been to describe the elements and their compounds one by one, but to give an available idea of chemical action; that it therefore supplies that to which the treatises just noticed do not sufficiently attend; and can therefore be read in conjunction with them, provided the student do not attempt to reconcile discrepancies in the graphic notation employed by the different writers, by enquiring, for ex-

ample, why ferrous oxide is written FeO by one and FeO by another. In developing the subject, the author professes to follow the inductive method. We need not discuss how far this is possible or advantageous, but it may be said that if pursued strictly and the induction is made complete, the instruction must be extremely tedious, and if not complete, that is if some part be taught dogmatically without proof, the form should not be styled inductive. But it is too much to surrender in teaching the ground which no one thinks of surrendering in actual investigation. There are other questions which might be raised—as to the advantage of beginning with hydrogen; as to the propriety of causing every student to decompose water, hydrochloric acid, &c., by electricity, when all these actions can be shown quite as profitably to a class; whether these difficult manipulations should precede the easily obtained reaction of acids and bases—but it is not necessary to discuss them here. The really valuable part of the book, that which gives it its character, is contained chiefly in the concluding chapters, where the student will find no hypothesis, but sober matter-of-fact generalizations, which he can bear about with him in all his chemical practice and reading. He may or may not accept the atomic addendum to the fact of combination in definite and multiple proportions, and find his progress assisted thereby, but his comprehension of the displays of chemical force will be facilitated by his having rules for the reactions which occur, and by being able to correlate particular instances with others of the same kind.

The study of these chapters will further assist in doing away with the committing of individual facts to memory, and thus call into play those faculties which science is generally supposed to exercise and strengthen.

Exchange Journals.

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VIRCHOW'S ARCHIV.

VOL. LVI., PART III.

N.B.—This part has not been forwarded to us, and was consequently overlooked in our last issue.

CONTENTS.—XX. Injury to the frontal lobe of the left cerebral hemisphere. A contribution to the pathology of injuries to the brain, and the localisation of the functions of the brain, by Dr A. Wernher, Giessen.

XXI. Anatomical studies on compensatory hypertrophy of the kidney, by Dr Leopold Perl, Berlin. XXII. A contribution to the pathology of the chloride of sodium, by Professor Falck, Marburg (Plate VII.) XXIII. A contribution to the study of rheumatism, by Dr Carl Heyman, Wiesbaden. XXIV. On the minute processes in healing by the first intention in tendons, by Dr P. Güterbock, Berlin (Plate VIII.) XXV. On the perenchymatous and subcutaneous injection of alcohol and similar substances, by Dr C. Schwalbe, Zürich. XXIV. A case of compound dermoid cyst of the ovary, by Dr C. Friedländer, Halle. XXVII. On Ainhum, a disease peculiar to the African race, by Dr Wucherer, Bahia, Appendix by Professor Schüppel, Tübingen. XXVIII. Carbonate of ammonia and uræmia, by Professor S. Rosenstein, Groningen. XXIX. The condition of the pupils in mental diseases, by Dr C. Wernicke, Breslau. XXX. A case of endocarditis ulcerosa puerperalis, with fungoid growth in the heart (*Mycosis endocardii*), by Hjalmar Heiberg, Christiania, addendum by Rud. Virchow. XXXI. Smaller communications. 1. On a case of makroactylis in a living person, by Dr W. Gruber, St Petersburg (Plate IX.) 2. Heterotopia of grey matter of the brain, by Dr Erman, Hamburg (Plate X. fig. 1.) 3. Congenital and progressive hypertrophy of the left hand, by Dr A. Ewald, Berlin (Plate X. fig. 2.) 4. On two different blood-colouring matters (epistolary communication), by H. Struve, Tiflis.

XX. Localisation of function in the brain. (*Wernher*).—This is an important contribution from the pathological side to the question of localisation of function in the brain. It may be known that Fritsch and Hitzig in Germany, and more recently Ferrier in this country, have been endeavouring, apparently with some success, by electric stimulation of the cortex of the brain in living animals, to discover the functions of the various portions of the brain. The present paper records a surgical case in which there was a local injury to the brain, and in which certain phenomena were produced which have a bearing on the question. The injury was to the left side of the head, and the first prominent nervous symptom was aphasia which supervened on the second day after the injury, and was perfectly typical; an acute traumatic aphasia therefore. It was found, after death, that a tear in the dura mater exactly coincided with the inferior part of the third frontal (Broca's) convolution. After this came on convulsive movements in certain groups of muscles, and these muscles were always on the right side of the body, that opposite to the lesion. Pflüger has shown that direct irritation of the brain produces convulsions of the opposite side, whereas, in reflex irritation, they are on the same side, so that here we have direct irritation of the brain substance. The muscles of the face were convulsed in a very marked manner. Fritsch and Hitzig found that irritation of the supra-Sylvian gyros (corresponding to the inferior frontal convolutions in man) produced convulsions of these muscles in the dog. Similarly there were convulsive contractions of the flexors and extensors of the fingers, while all the other muscles of the arm were perfectly at rest, so that we have here a distinct localisation to two groups of muscles. This observation also agrees with the results of Fritsch and Hitzig, and seems to corroborate their view, that the motor impulses originate in the cortical substance of the brain, and that the various groups of muscles have distinct centres for themselves. We see in this case the opening up of a field in which the observations of the surgeons during life, conjoined with *post-mortem* investigation, might lead to important results.

XXI. Compensatory Hypertrophy of Kidney (*Perl*).—The author has made careful measurements of the various constituent structures of the

normal kidney, and compared them with those of the kidney enlarged by compensatory increase of action. In the cases investigated, the opposite kidney was put out of action by a hydronephrosis on that side. The conclusions come to are, that though in the normal kidney these structures are, at the different ages, of nearly the same size, and the normal growth of the kidney therefore results from a numerical increase or hyperplasia of these elements, the opposite is the case in compensatory hypertrophy. Here there is a true hypertrophy, the convoluted tubules and their epithelium presenting a very distinct and absolute increase in size. The straight tubules are not at all increased in size, and the Malpighian bodies not perceptibly. At the same time there is probably, along with this enlargement, an actual new formation of the gland tissue and blood-vessels.

XXII. The Effects of the Infusion of NaCl into the Blood (*Falck*).

—The infusion of large quantities of NaCl into the blood of the dog produces pretty rapid death. Phosphate of sodium is much less active, and the *post-mortem* appearances are different. When NaCl is introduced into the system, it is eliminated by the kidneys with extreme rapidity, but the rapidity is much greater when it is introduced directly into a vein than into the stomach.

XXIII. Rheumatism produced by Reflex Action (*Heyman*).—

The following rather interesting observation was made by the author:—While practising in the country a barn caught fire. A large number of people engaged in extinguishing the fire stood in a neighbouring brook up to the knees, filling the buckets. Of these, four took ill, and all of them with different complaints. One had acute rheumatism, chiefly in the knees; another had a stiff neck; a third had angina; and the fourth acute desquamative nephritis, from which he recovered. The author supposes that the cold, applied to the cutaneous sensory nerves, produced in the centres a reflex irritation, which, acting on the trophic nerves in different ways, produced these various affections. Rheumatism, therefore, according to him, is an inflammatory disturbance of nutrition produced in a reflex manner.

XXV. Treatment of Tumours, &c., by injection of Alcohol (*Schwalbe*).—

Following out his very successful treatment of goitre by the injection of tincture of iodine and alcohol (See this Journal, May, 1872, p. 410), the author used similar methods in other cases. He gives a case where a lipoma was reduced to one-half by injecting alcohol. He recommends that in aneurisms, varix, and in every case where a cicatricial contraction or sclerosis of the connective tissue is desirable, the parenchymatous and subcutaneous injection of alcohol should be used, the concentration, quantity, and frequency being regulated by the circumstances of each case.

XXVII. Ainhum, a Disease of the Negro Race (*Wucherer and Schüppel*).—

This disease, which has been described and figured in the *Pathological Transactions* of London, Vol. XVIII., consists in the formation of a furrow at the root of the little toe, which, gradually extending, causes the toe to hang loose, and finally, if not previously amputated, to drop off. Schüppel, who examined a specimen, finds no inflammatory condition. He supposes that the original furrow, which may be accidental, with its dried-in epidermis, and afterwards the cicatrix, which forms at the bottom of the furrow, act as a kind of ligature, causing atrophy of the parts beneath, even including the bone, and finally separation.

XXVIII. Symptoms produced by Carb. of Ammonia compared with those of Uræmia (Rosenstein).—This paper contains a number of experiments in which carbonate of ammonia was injected into the blood of frogs, dogs, and rabbits. This substance produces uniformly symptoms comparable with those of epilepsy, the symptoms depending on cerebral irritation, as they did not occur when the brain was divided from the cord. The phenomena are only temporary, and the substance is rapidly eliminated by the kidneys. Even when the kidneys have been removed, the symptoms pass off, although there is almost no elimination through the lungs. It is not known whether in this case there is a vicarious elimination by the skin, or whether the NH_3 is converted into nitrate. The principal difference in the symptoms produced by this substance, and those of uræmia, is that in the former case there is always the same series of symptoms, namely, those of epilepsy, whereas in the latter we have epilepsy, coma, convulsions, delirium. In certain cases the uræmic symptoms are very like those of epilepsy, but in these cases it is frequently impossible to detect carb. of ammon. in the blood. Notice in relation to puerperal convulsions, that in poisoning with carbonate of ammonia, the administration of such narcotics as morphia, chloroform, and chloral, seemed to have no influence in checking the convulsions. Further, comparing the dose necessary to produce poisonous symptoms in animals with the body weight, it would need not less than 30 grms. (462 grs.) to produce similar symptoms in man.

VOL. LVII., PART II. APRIL, 1873.

CONTENTS.—IX. Two osteomata of the frontal sinuses, by Professor J. Arnold, Heidelberg (Plate II.) X. A contribution to the histology and development of the fibroma of the mamma, by Dr J. Rosentirn (Plate III., fig. 1-3.) XI. Adenoma of the pituitary gland, by Dr M. Loeb, Worms, and Professor J. Arnold, Heidelberg (Plate III., fig. 4-5.) XII. Experimental investigations on the functions of the brain, by Professor H. Nothnagel, Freiburg (Plate IV., fig. 1-4.) XIII. On the origination of hypertrophy and dilatation of the heart from the fatigues of war, by Dr O. Fräntzel, Berlin. XIV. On diptheritic endocarditis, by Professor C. J. Eberth, Zürich. XV. Contribution to the study of epilepsy, its results and complications, by Dr Von Mandach, Schaffhausen. XVI. The electrolytic treatment of malignant tumours, by Dr W. Neftel, New York. XVII. Smaller communications; 1. Medical and scientific obituary for 1872, by Dr W. Stricker; 2. A rare malformation of the thorax, by M. Fleisch, Frankfort; 3. A hard spindle-cell sarcoma, of the metacarpus of the thumb, by Dr Fritze, Schwalbach (Plate IV., fig. 5-8); 4. Table of the swine killed and examined for trachinæ in Rostock, by Petri.

IX. Bony Tumours Originating in the Frontal Sinuses (Arnold).—The first of the cases recorded here is one in which a bony tumour had originated within the frontal sinus, which it filled and distended. It had burst through the walls of the sinus at one or two places, but elsewhere lay for the most part free and moveable within the cavity. The second was a much larger tumour, and had long burst through the walls of the sinus, sending processes in various directions. This tumour was partially removed by operation, and the patient died with purulent meningitis, and an abscess of the left frontal lobe of the brain, which had burst into the left lateral ventricle. The portion which had been removed being restored to its position, it was seen that the tumour had a common centre about the

position of the glabella at the root of the nose, and at its outer part this root was covered by a mucous membrane with ciliated epithelium. The following were the processes:—One passed upwards, projecting beyond the level of the frontal bone in front, another projected into the orbit, a third into the nasal cavity, and a fourth into the cranial cavity. According to the author, this tumour originated in a similar situation to the first—namely, the posterior and inner wall of the frontal sinus. By its growth it had caused the disappearance of the entire anterior wall of the sinus.

XII. Localisation of function in the brain (*Northnagel*).—We have in these researches another attempt at the localisation of function of the brain, from the experimental side. The author in his experiments so operated as to put a small portion of brain substance out of action, with as little disturbance of the rest of the brain as possible. With this view he makes a perforation in the skull of rabbits with a short needle, at any desired spot, and then introduces the needle of a hypodermic syringe, and injects into the brain, a minute drop of a concentrated solution of chromic acid. The perforated needle is not larger than an ordinary sewing needle, and the quantity injected is very small. The result is that a small portion of brain substance becomes firm and hard, and of a greenish colour; and this appearance was found to be retained throughout the period to which his experiments extend. By this means a limited portion of brain substance was put out of action. In the first place it was found that when the injection was made into a certain definite spot on the upper surface of the hemisphere, the animal always showed signs of having lost entirely or partially the knowledge of the position of the limbs, on the opposite side from the affection of the brain. There was thus a partial paralysis of the so-called muscular sense. When the leg of the animal was placed in any position, even though it were a very awkward one, it would not draw it back, and yet there was no paralysis of sensation or motion, the animal leaped about, and reacted to stimulation of the cutaneous nerves just as usual. It is a remarkable feature in these observations, however, that these phenomena disappeared in a comparatively short time, and the muscular sense seemed to be recovered. It is also to be noted that Fritsch and Hitzig found in dogs a spot having a similar situation, which had apparently a similar function. These observations seem to show that the muscular sense is not dependent on the cutaneous sensibility, for in all these cases this was preserved. They also confirm the views of Leyden, that the muscular sense does not dwell in the spinal cord, and when in locomotor ataxy the cord is diseased, it is simply the conducting nerve-fibres which are interfered with. Another point on the surface of the cerebrum, situated on the lateral aspect slightly in front of the former, was also found to have a special function. When the injection was made into this part, a form of paralysis appeared which seems in rabbits to be equivalent to hemiplegia in man, the limbs of the side opposite to that of the brain lesion deviated inwards, and those of the same side outwards. This paralysis also disappeared in from six to ten days; sensation remained throughout. In other parts of the surface of the cerebrum he produced similar paralysis only when the white substance was involved. Here again the paralysis disappeared through time. This fact of the disappearance of the paralysis, in all the cases mentioned, is an extremely interesting one. It would seem almost to indicate that the functions of the brain are only provisionally localised, and when the present local habitation of a particular function is destroyed it by-and-bye finds for itself another. It therefore speaks strongly against the idea that the mental functions are strictly localised to distinct centres in the cortical substance. The central portions of the brain were investigated in a similar manner.

When injection was made into the nucleus lenticularis, there was also paralysis, the limbs and vertebral column being curved with the convexity towards the opposite side. This also was evanescent, but remained longer than in the former cases. In investigating the nucleus caudatus (corpus striatum), a limited spot was discovered, which seemed to have a very peculiar function. When this spot, which is situated near the internal and anterior part of the ganglion, was affected, then the animal ran about with great vigour for a time, leaping over obstacles, and persisting in running forward till it was nearly exhausted. The irritation of this particular part seemed to produce this peculiar effect, of setting the animal to run. After the first race was over, there was no repetition of the phenomenon. When other parts of the ganglion were affected, even though the spot just mentioned were included, there was a simple paralysis; and it was only when that spot alone was hit on that these peculiar symptoms resulted.

XIII. Enlargement of the Heart from the Fatigues of War (*Früntzel*).—The author of this paper met with no cases of hypertrophy and dilatation of the heart in the Danish war of 1864, or the Austrian of 1866; but he remarks that in the former there were not many exhausting marches, and the latter was short in duration. In the French war of 1870, however, the men were exposed to great hardships, and to long and rapid marches. In one battalion, of which he had temporary charge, he has found 19 cases of hypertrophy and dilatation in men who were healthy before the war. Of these, 10 are cases of hypertrophy and dilatation of the left ventricle, 2 of the right, and 3 of both.

XVI. The Electrolytic Treatment of Cancer (*Nefel*).—This paper contains the description of a mode of treatment, which, if experience confirms the results stated here, must be considered one of the greatest boons which have been conferred on suffering humanity. It is no less than a cure for cancer. The paper begins with a discussion as to the nature of cancer. Following the school in which he was educated, the author at first looked on malignant disease as primarily a constitutional affection, of which the tumour was merely the local manifestation. He has been, however, convinced, by the arguments of Virchow, that cancer is really at first a purely local disease, and that any generalisation which may occur is a secondary result of the infection of the system from the local disease. He treats of the traumatic origin of cancer, and gives two cases in which mammary scirrhus was distinctly traced to the effects of a blow. Coming to treatment, excision is generally of little or no advantage. He has found electrolysis alone useful. Before giving the results of his treatment and the method, he discusses its *modus operandi*; and states it as his belief that the action is not that of a caustic; but that the electric stimulation has some influence on the protoplasm of the cancer cells, causing them to alter their mode of life. He believes in Waldeyer's views as to the development of cancer, namely, that it always originates from epithelium (see this Journal, Nov. 1872, p. 135), and does not distinguish clinically between carcinoma and canceroid. The first case in which he tried the treatment is given in detail, and is of considerable interest. A gentleman had a tumour of the left mamma, with secondary affection of the axillary glands. It was diagnosed as cancer by Nelaton, Moore, Marion Sims, &c., and was finally extirpated. A similar tumour appeared on the right breast; while the glandular enlargements in the left axilla recurred, and the patient became markedly cachectic. This tumour in the right breast as well as the axillary glands were treated in the manner to be afterwards described, and the result was that the tumour completely disappeared, and

the cachexia was entirely recovered from. A variety of other cases are given, all showing how speedily many cancers can be made to disappear, and especially how, after the first electrolysis, the lancinating pain passes off. In accordance with Virchow's views, he believes that there is an initial stage in which cancer is purely local, and in this stage he asserts that it can be completely cured by electrolysis. When the disease has advanced beyond this the cure is difficult, and its success depends on whether all the affected parts can be reached. When the tumour is adherent to the deeper parts, or when distant organs are secondarily affected, the treatment is generally unsuccessful. Even in the most aggravated cases, however, this is the best means of reducing the pain, and improving the general condition of the patient. The method of applying the agent is described with great care. Suppose, in the first place, that the tumour is of moderate size, hard, and slow of growth. With or without chloroform, as circumstances may determine, 2, 3, or 4 needles are introduced at equal distances into the tumour, and connected with the negative pole or cathode of the battery. The positive pole or anode is connected with a broad plate, which is applied with a wet compress to the skin at a certain distance from the tumour, and moved from place to place. The current is gradually increased up to 35 or 40 elements, and after 20 to 30 minutes, gradually lessened, and needle after needle withdrawn. This operation is repeated for a limited number of times at intervals of three or four days, the needles being introduced at different parts of the tumour. After this energetic treatment, a weak current of 4 to 8 elements is to be used daily for months. The negative pole, formed of a flat plate and a wet compress, is placed over the needle punctures, and the positive at a distance from the tumour as before. The sloughs produced by the needles come away after a time, and their track serves as a conductor for the current. If, in the second place, the tumour be a large one, then the only modification is that, during the operation, needles should be extracted and placed in different situations. The number of the needles should not, however, be increased above 4 at one time. If, in the third place, the tumour be large and ulcerating, then an attempt is made to produce sloughing of it. In this case, the anode (or positive) needle is thrust into the centre of the tumour, and its base transfixed with a number of needles connected with the negative pole. These are left for about 20 minutes, and then inserted in a different position. In from seven to ten days the whole or part of the tumour generally sloughs away, and if it is not entirely removed, the operation may be repeated. After this rather severe treatment, there is never any fever or special constitutional disturbance. In this case also, after the tumour has sloughed, the treatment with weak currents should be continued for months. Of late, the author has sometimes introduced a slight difference in the treatment of the first and second class of cases. Instead of inserting cathode needles throughout, he has occasionally begun with an anode needle, which he has only kept in for a short time, and he thinks this an improvement on the original plan. The anode needle should only be kept in for a short time, as otherwise it is apt to cause sloughing; after this single application of the positive needle, he continues as before. It is to be noted that the author attaches great importance to the efficient carrying out of the treatment with weak currents, after the energetic currents have been used preliminarily; and he generally entrusts this latter treatment to the patient. The author has also used a similar mode of treatment, as others have done, in aneurisms, varix, &c. His method is in this respect different from the usual, that he does not insulate the stems of the needles which he introduces.

STRICKER'S JAHRBÜCHER.

1872. PART II.

CONTENTS.—I. Studies on the physiology of the heart and blood-vessels, by Dr S. Mayer, Prague. II. On enuresis, by Professor Leopold Dittel. III. On changes of the parenchyma of the liver in prolonged closure of the ductus choledochus, by Dr H. Mayer, Munich. IV. Investigations on the organization of the thrombus, by Dr T. Durante, Messina. V. Contributions on the process of adhesion in ligatured vessels, by Dr Dudukaloff, Charkow. VI. On the inflammatory changes of the epithelium of the urinary tubules, by Dr M. Lipsky, Kiew. VII. Contributions on the so-called endogenous cell-formation, by Professor G. Bizzozero, Pavia. VIII. Contributions to the pathology of the blood, by S. Stricker. IX. A diagnosis of disease of the optic thalamus, by Professor Meynert, Vienna.

I. Action of Strychnia on the vaso-moter Centres (Mayer).—This is a very interesting paper in many respects, and it brings out certain points in respect to the action of strychnia which are of some consequence. It is found that when strychnia is administered to dogs, the intravascular pressure is markedly increased, as recorded in the usual way with the kymographion. It might be supposed that this increase of pressure is produced by the spasm of the muscles in the tetanic convulsions, the contracted muscles acting as obstructives, and so raising the pressure within the vessels. But this was disproved by the fact that when the animal is first placed under the influence of curare, and the voluntary muscles thus paralyzed, the increase of pressure still occurs on strychnia being administered, although there is no spasm of the voluntary muscles. The actual cause of the immense increase of intravascular pressure, is an intense irritation of the vaso-moter centres in the encephalon, and a consequent contraction of the small arteries—this narrowing of the arteries acting as an obstacle, and so raising the pressure. This view is confirmed by the observation that, after the administration of strychnia, the intestines of the animals become perfectly pale, and only gradually recover their colour as the influence of the poison passes off. It was also found that when previous to the administration of the strychnia the cord was cut high up, so that the connection between the vaso-moter centres and the vessels was severed, then no, or very slight, increase of pressure resulted from the administration of the agent. A further point of some interest was elicited. It is known that the irritation of a sensory nerve produces increase of the intravascular pressure, and it might be supposed that, when as a result of the action of strychnia, the pressure had already been raised so high, the irritation of the nerves would have no further effect. The contrary was, however, found to be the case, the strychnia does not alter the relation between the vaso-moter centres and the sensory nerves, and although these centres were already in a high state of irritation by the strychnia, they were still capable of more.

II. The Internal Sphincter Vesicæ (Dittel).—It has been asserted by Budge, chiefly on experimental grounds, that there is no internal sphincter to the urinary bladder, but that the neck is closed by the constrictor vesicæ et bulbocavernosus. The present author asserts the existence of a special internal sphincter, which is composed of involuntary muscular fibre, and is situated at the vesical end of the urethra. The author supports his position by various observations and experiments. In

the first place, it is pointed out that in cases of division of the urethra for stricture and in central lithotomy, the external sphincter is put out of action, and yet the patient does not micturate continuously as he would do were there no internal sphincter. The urine in such cases is retained until a certain pressure is reached, and then it is passed in some quantity. Again, the observation of certain conditions in the dead body supports the author's view. If a case be taken in which the patient had died with the bladder full, and the external sphincter be dilated by a sound passed into the membranous portion of the urethra, it is found that no urine escapes on pressing the fundus of the bladder. But if the sound be pressed into the bladder so as to dilate the internal sphincter as well, then pressure causes the urine to flow out. In the next place experiments were made on animals with a view to testing these views. In animals which have been curarised, the urine does not flow off, although by the curare all the voluntary muscles, and among them the external sphincter, have been paralysed. Further, in some animals the abdomen was opened, and the bladder connected with a vessel containing solution of common salt, by means of a tube introduced into the ureter, in such a way that the vessel could be raised and lowered, and thus the pressure of the fluid within the bladder be varied. The prostate was then cut away about two lines from the internal sphincter, so that the external sphincter was completely removed. It was then found that when the bladder contained urine at the ordinary pressure, the internal sphincter was sufficient to prevent the bladder being emptied; but when the salt solution was allowed to flow in under pressure there was some escape, which, however, could be stopped by faradisation of the internal sphincter. From this it appears that the internal sphincter is able to hinder the passage of urine till a certain pressure is reached. The author next mentions the various diseases in which enuresis seems to be produced by the internal sphincter being put out of action. In stricture the new-formed connective tissue may replace the muscle, or the stricture may lead to a sudden dilatation of the urethra behind the seat of stricture, and involving the internal sphincter. It may also be interfered with by hypertrophy of the prostate. Atrophy of the prostate (which, contrary to the usual belief, is more frequent in old persons than hypertrophy) also causes atrophy of the sphincter. Finally, in old people, the involuntary muscular fibre of the urinary bladder, and of the sphincter, is often in a state of fatty degeneration, and this may explain in some measure the frequent enuresis of the aged.

IV. Organization of Thrombus after Ligature (*Durante*).—This paper contains a series of experiments with a view to determining the process by which, after ligature, the closure of vessels is effected. The results differed to a slight extent according as a single ligature was put on the vessel, or a double one, including a portion of vessel. When the single ligature is used there is first the coagulum at and near the point of ligature. Then the internal coat undergoes a kind of inflammatory change, abundant round and spindle-shaped cells replacing this coat. Among these cells, also, blood-vessels develop. By this means the coagulum is gradually pushed inwards and replaced, till it finally disappears. The white corpuscles and fibrine of the original clot become fatty before disappearance, and the red ones are flattened. The coagulum is thus a *transitory* thrombus, and is replaced by the *permanent* one formed by the internal coat. This process is very limited when there is simply a ligature of a vessel, but it may be made to extend a considerable distance by simultaneously painting the vessel with iodine. When a double ligature is used the process is somewhat similar, with the exception that the seat of the cellular growth is not the interior but the middle and external

coats, the internal coat being destroyed. Soon the two proliferating coats become blended in one cellular layer, and the normal structure cannot be distinguished. The cellular growth in both cases ultimately develops in the usual way into connective tissue. The view which some authors take, that the organization depends on amoeboid cells, is controverted by this author, and even in experiments made with vermillion he could find no confirmation of this view. Further, two modes of softening of the thrombus are distinguished, which have indeed very different significance. The one is the softening of the transitory thrombus, which precedes its absorption and depends as above on fatty degeneration, and the other is a suppuration of the permanent thrombus, which results when the cellular proliferation goes beyond proper bounds.

V. Further observations on Ligatured Vessels (*Dudukaloff*).—The observations contained in this paper were made on animals, in which two or three ligatures had been applied to vessels, and they substantially agree with those of the previous author. He found that in the neighbourhood of the ligatures, there was a collection of cells in the external coat, and to a certain extent in the middle. This cellular growth also possesses vessels, and it passes into the lumen of the vessel and gradually fills it up. The development of the growth into connective tissue completes the closure of the vessel by adhesion.

VII. Endogenous Cell-Formation (*Bizzozero*).—It is not an extremely uncommon observation to find smaller cells contained within larger ones, and at one time it was supposed that the small ones must, in every such case, be formed endogenously within the large. The author does not deny the possibility of this in certain cases, but he gives cases in which this was distinctly not the mode of formation. The cases referred to were cases of hypopyon, in which the pus contained large cells, inside which were smaller ones, the latter having the character of pus corpuscles. The opinion which the author comes to, and which he supports by various facts, as well as by experiments on animals, is that the pus corpuscles are not formed endogenously, but are, as it were, devoured by the larger cells. These are the grounds for this opinion. (1.) There were no intermediate stages visible, the contained cells being always fully formed pus corpuscles, and these, too, apparently old and no longer contractile. (2.) The phenomenon of cells contained in cells only occurred in cases where the pus had been several days in the anterior chamber, and the most of the pus cells had already lost their contractility. (3.) Again, large cells, which were distinctly contractile, were found in the fluid, and it is well known that such contractile cells are able to take up solid bodies into their substance. (4.) It is very important to observe that some of these large cells contained red blood corpuscles either alone or along with pus corpuscles. The experiments on animals were made by passing a thread through the cornea, and they completely corroborated the above results. Here, when suppuration was produced, the cells containing cells never appeared in the earlier stages, and the contained pus corpuscles were always old, some undergoing retrograde changes. The author also injected blood into the anterior chamber, and found that the large cells also took up the blood corpuscles. Lastly, he considers that these large cells are hypertrophied pus corpuscles, and are not, as might be supposed, derived from Descemet's membrane, as he never saw any active process there.

VIII. Stricker on Lister's Syphilis-Corpuscles (*Stricker*).—This well-known writer devotes a pretty long paper, embodying a large number

of observations, to the study of the bodies which Losterfer first discovered in syphilitic blood. (See this Journal, Nov. 1872, p. 139.) The method of observation is here carefully described, and then the results are given. The most of these observations were made on a syphilitic patient, 22 years of age. It appears that at the ordinary temperature of the air, the corpuscles develop slowly as Losterfer described; but that in a hot room, or when placed on a heated microscope stage, they develop with extreme rapidity. Thus when heated to about 25° C. (77° F.), they attained the size of a very large nucleus in about an hour after being taken from the body. On the other hand, when heated to 38° C. (100·4° F.), they appeared in very large numbers, but did not attain such large dimensions. As to their nature, Stricker looks on these bodies as being organisms, and this conclusion is come to chiefly because he has observed in them processes which he must consider to be vital. Thus he saw how two bodies united into one—they approached and withdrew, and repeated this process several times before finally uniting. The two bodies were, during this process, united by a fine fibre, which thus showed contractility, and this implies life. The view is confirmed by the power of growth which they possess, and by the fact that, although when first formed they are very easily destroyed by re-agents, yet after a few days they have much greater power of resistance. These bodies, then, are organisms, which develop slowly at a temperature of 10° C., and, probably not at all at a temperature essentially lower, but very quickly at 20°—25° C. They grow by budding or division, and appear to develop best in the neighbourhood of collections of blood-corpuscles on the one hand, and an air bubble on the other. The source of these bodies it is very difficult to discover, and the author does not offer an opinion. He has investigated the blood of persons other than those suffering from syphilis, and gives his results. He found these corpuscles in nine cases of syphilis out of thirteen. He did not find them at all in the blood of ten healthy persons. He found them in one case of pneumonia, one of heart disease, four of typhus abdominalis (typhoid), one of typhus exanthematicus, and ten of small-pox. In ten cases of lupus he found them twice. He found them, however, in great numbers in advanced cases of tuberculosis and cancer, and it seems as if they were developed in tedious emaciating and exhausting diseases. In this reference the query turns up, Can such diseases originate the virus of syphilis? In regard to this question, as well as all those under discussion, one can hardly fail to remark that in this paper, although much is suggested, there is very little dogmatic assertion of any theory. The condition of mind seems rather tentative than otherwise, and this condition of mind seems very well suited to the subject.

PART III. 1872.

CONTENTS.—I. Contributions from the Pathological Institute of the Vienna University, by Dr Ernst Fleischl, Assistant. 1. On certain tumours, by Dr Fleischl; (A.) Tumours of the brain; (B.) On the cavernous tumour. 2. The tuberculous ulcer in the larynx, by Dr C. F. Wahlberg. 3. The round ligament of the uterus, by Edward L. Schiff. 4. An adenoma of the wall of the stomach, by Dr A. Winiwarter. 5. The pathological anatomy of the liver, by the same. II. On vaccination and re-vaccination and their insufficient performance hitherto, by Dr O. Eyslein.

II. Vaccination and Re-vaccination (*Eyslein*).—The author first gives a history of the progress of vaccination and its effects in England

and the other countries of Europe. Even till the present day, epidemics of small-pox occasionally break out, and the author suggests various explanations of this fact. In the first place, the historical account with which the paper commences points out that in the first decade of this century, and even later, vaccination has not been so fully carried out as it ought to be. Now-a-days also, when the epidemics are so much less severe, much less precaution is probably taken to isolate cases of small-pox, than before the introduction of vaccination. Then again the immense development of trade and travel in recent times, has very materially increased the chances of infection being carried. The author further states it as his belief that primary vaccination done in infancy gives immunity till fifteen years of age, and that at this age re-vaccination should always be performed. But re-vaccination does not give complete immunity for the rest of life, and it should be repeated at intervals of years. The results depend in great degree on the quality of the vaccination. The author enjoins that the laws should be very strict in regard to vaccination. He says, "It cannot be allowed to any one to expose himself to the infection of a contagious disease, against which he can protect himself, when by thus refusing protection he puts others in danger of being infected by the disease." Re-vaccination should also be enforced by law, but as this is not yet the case, it should be strenuously enjoined by all who have the opportunity, such as hospital physicians, &c. Re-vaccination should always be done by lymph from the cow or the child, never from that of a re-vaccinated person. The dilution of the lymph by glycerine is said by Müller even to increase its powers, apparently by hindering the coagulation of the blood in the person vaccinated; but the greatest care must be taken that the glycerine is pure. One part of lymph should be mixed with two of glycerine and two of distilled water. He gives finally, as an appendix to his paper, a new scheme of vaccination laws suggested for the German Empire.

REICHERT AND DU BOIS-REYMOND'S ARCHIV.

PART IV. 1873.

CONTENTS.—I. Physiological studies on the action of flesh-juice, extract of meat, potash salts, and creatinine, by Dr Bogosslowsky (conclusion.) II. On the structure of the conarium (pineal gland), by Dr Hagemann, Göttingen (Plate XIII.) III. A contribution to the question whether nerves are capable of conducting either sensory or motor impressions indifferently, by Dr Pintschovius. IV. Contributions to physiology, by Dr Dönhoff. V. On the saccharifying power of the child's saliva, by Dr Jul. Schiffer, Berlin. VI. Contributions to the zoological and zootomical study of the so-called anthropomorphous apes, by Robt. Hartmann (continued) (Plate IV.) VII. On Van Vetter's method of preserving anatomical preparations, by Dr L. Stieda, Dorpat. VIII. On the formation of villi in the gall-bladder and its significance, by C. Mettenheimer.

I. Physiological action of Extract of Flesh, &c. (Bogosslowsky).—It having been disputed whether the stimulating action of extract of flesh and flesh-juice depends on the organic matters contained in it or on the potash salts, these experiments were undertaken with a view to deciding the question. Two pretty extensive series of experiments on rabbits are detailed, the one with flesh-juice and extract as compared with corresponding amounts of potash salts, and the other with creatinin. We can only

give here the following general conclusions:—1. The action of flesh-juice on the pulse and temperature does not depend exclusively on the amount of the potash salts, as Kemmerich has asserted; it is an essentially complicated phenomenon, produced both by the potash salts and extractive matters. 2. Further, the creatinin takes part in the stimulating action, but the presence of this substance does not entirely explain the action of the flesh-juice, which must be in part also ascribed to the so-called extractive matters. 3. The temperature of the substances, when taken, has an undoubted influence in the resulting increase of pulse and temperature, as ordinary water heated to 38° – 40° C. has a distinctly similar though less effect. 4. Death was produced in rabbits after the administration of concentrated flesh-juice, the cause of death being paralysis of the heart produced by the joint action of the potash salts and creatinin. It may be remarked, in conclusion, that the author, besides the experiments on animals, made some observations on the effect of flesh-juice on man. Perhaps the most important result he came to was, that symptoms of poisoning appeared only when he had raised his dose of Liebig's extract to 40 grammes (about 600 grains).

III. Conducting power of Nerve Fibres (*Pintschovius*).—This seems an important contribution to the question, whether the sensory and motor nerves respectively are dissimilar in their actual structure, so as to be incapable of conveying impressions of an opposite class, or whether they are only dissimilar in their terminations. The endeavour in these experiments was to cause motor impressions to pass through sensory nerves, or sensory impressions through motor nerves. With this view, a considerable number of experiments were made with the nerves of the tongue of the frog, but many of these failed on account of the difficulty of causing the cut ends of the nerves to unite. In one experiment which succeeded, the following were the conditions:—In a number of frogs, both the nerves of the tongue were cut on the left side, then the central end of the hypoglossus (which, is a mixed nerve) and the peripheral end of the lingualis (which, as proved by experiment, is sensory) were united; the other ends of the two nerves were destroyed. Unfortunately all the frogs so operated on died except two, and in only one did union of the nerves take place. In this one, however, the results are such as seem to decide the question. It was found that at the end of five and a-half months from the time of operation, when the animal was examined, the left side of the tongue as well as the right, though to a less degree, replied to a reflex stimulation by acetic acid. This seems to mean that the motor impulse, which originated in the ganglionic centre of the hypoglossus, was communicated at the point of union to the fibres of the lingualis, and conveyed by them to the muscles. Dissection of the parts showed that the two ends of the nerves were united by a cicatrix, through which nerve fibres could be traced. This observation, therefore, would seem to prove that there is no specific difference between sensory and motor nerves, so far as the nerve fibres themselves are concerned, but that the difference lies in their central and peripheral end-organs.

V. The Saccharifying Influence of Infant's Saliva (*Schiffer*).—It has been hitherto generally believed that the secretion of the mouth of sucking infants does not possess the power of converting starch into sugar, as does that of older persons. The author of this paper gives certain observations which show this to be incorrect. He placed little bags of tulle containing starch in the mouths of new-born infants, and of sucklings at various ages. In every case he found that on applying Trommer's test to the contents the copper was reduced, showing the presence of sugar.

VII. Method of Preserving Anatomical Preparations (*Stieda*).

—This method, which was published in 1867, and is revived by the author, may be found useful by anatomists. Its advantages are, that instead of the stiff varnished or other preparations of muscles and joints, we can have them freely moveable. The preparation is first dissected, and then laid for from eight days to six weeks, according to its size, in the following mixture:—Take six parts by weight of glycerine, one of brown sugar, and a half of saltpetre; stir the mixture. After lying the proper length of time, the preparation is to be hung up to dry for two to six months. At first it is stiff, but by degrees it becomes flaccid, and serves well to show the motions of the muscles and joints. The originator of the method, Vetter, used a varnish, but Stieda could not get the varnish mentioned by him, and found the preparations do well without. If the colour is not good, the preparation should be hung in the sunlight.

PART V.

CONTENTS.—I. Investigations on the ovary and its relations to the peritoneum, by Dr H. Kapff (Plates XIV. and XV.) II. On the innervation of the vessels of normal and inflamed tissues, produced by sensory irritation, by E. Pick, Stettin (Plate XVI.) III. A contribution to the study of the lyssa or mad-worm, by J. M. Dietl (Plate XVII. A.) IV. On hare-lips cicatrized in utero, by Dr M. Bartels (Plate XVII. B.) V. Striated muscular fibre, by Carl Sachs (Plates XVIII. and XIX.)

IV. **Intrauterine Cicatrization of Hare-Lip** (*Bartels*).—The author details three cases of his own in which there were cicatrices found at birth, indicating that hare-lip had united in utero, and, in addition, he gives an abstract of several other recorded cases. He then proceeds to enquire how this cicatrization may be produced. In the first place there are two forms of hare-lip, that in which the lip alone is divided, and that in which the bones are also cleft, the former being simple and the latter complicated. Now, in the latter case the divided bony parts may unite in utero, and the soft parts may remain divided, or may unite along with the bone. Doubtless some simple hare-lips originate in this way, being as it were the remains of complicated cases of which the maxillary and palatal parts have united. The soft parts of the upper lip are not formed in segments like the bony parts, but the upper lip grows down from above in a continuous layer, and from this it might be supposed that every case of simple hare-lip owed its origin to a complicated hare-lip in which the bony parts had united. But the author points out that, though the upper lip normally grows in a single piece, yet it owes its origin primarily to a number of germinal points corresponding to the original pieces in the bone. These germinal points unite early in normal cases, and the lip grows as a single piece. But in certain cases the different germinal points take on a certain independency of growth—do not grow equally, and so their union is disturbed. The longer the union is of being established, the greater will be the resulting cleft. In this way a simple hare-lip may arise without any division of the bones. But in whatever way a simple hare-lip has been formed, it seems to be still capable of a secondary cicatrization in utero. When union takes place at the earlier times of utero-gestation, already referred to, there will be no proper cicatrix; but when once the formation of the part is completed, then any union will be accompanied by a cicatrix. As to the way in which the secondary cicatrization occurs, it may be by a process such as sometimes occurs after birth. The proximal edges of the hare-lip being in contact, the epithelium may give way, and the two raw surfaces unite with cicatrization.

PART VI.

CONTENTS.—I. The development of the human frontal bone, by Dr H. v. Jhering, Göttingen (Plate XVII. C.) II. Comparative observations on the variations of the length of the intestine, and in the area of the surface of the intestinal mucous membrane in animals of the same kind, by Dr H. Crampe, Proskau. III. Contributions to physiology, by Dr Dönhoff. IV. The respiration of frogs, as a means of characterizing their natural history, by W. Müller, Perleberg. V. Remarks on the foramen mentale, by Dr W. Gruber. VI. Contributions to the physiological action of the nitrite of amyl, by Dr F. A. Hoffmann, Berlin. VII. On the power of the frog to withstand high and low temperatures, by W. Müller, Perleberg. VIII. Historical note, by E. du Bois-Reymond.

VI. Sugar in Urine from Nitrite of Amyl (*Hoffmann*).—The author of this paper, who has already along with Bock discovered that melituria may be produced by the injection of solution of salt (see this Journal, Nov., 1872, p. 140.) here states that he has also produced it by the administration to rabbits of amyl nitrite. The sugar appeared in from two to five hours, and was at first very abundant, but gradually decreased in quantity till, at the end of from twelve to thirty hours, there was no longer a trace. It has been shown that in the case of diabetes produced by injury of a certain spot in the fourth ventricle (the *Pigûre-Diabetes* of Bernard) the cutting of the splanchnics prevents the appearance of sugar in the urine. The present author, considering this fact, cut the splanchnics in some rabbits before giving them the amyl, and though most of the rabbits died soon after the operation, yet in some which withstood the operation, and to which he could administer a small dose of amyl, no sugar appeared. He does not, however, consider this result as absolutely to be relied upon. It may be remarked that the author here attempts no explanation of the facts discovered. He states that there is still a good deal of work done by Bock and himself to publish.

VII. Limits of Temperature borne by Frogs (*Müller*).—This paper contains a number of experiments with the view of determining how low and how high temperatures could be borne by frogs without being killed. He found that he could freeze frogs in water, and leave them for hours frozen in the ice, and yet on thawing the water they recovered and appeared none the worse. He has left one in ice at a temperature of -5° R. (21° F.) for six hours, and yet recovery took place. The most of these experiments took place in winter, and by natural cold. It was found much more difficult to freeze the animals and yet preserve life in summer. When placed in a bottle containing water, around which was a freezing mixture, they always died. A partial success was, however, attained by very gradually cooling the frog, and then freezing it. The boundary line in the opposite direction was much more distinctly marked. When placed in water which is gradually heated, the frog gets very energetic when the temperature gets above 20° R. (77° F.); but becomes quieter at 26° R. (90° 5. F.); and suddenly dies at 28° R. (96° F.), so that this seems the absolute limit. By this observation the author seeks to explain the fact that in dry summers fish are often found dead in large numbers near the banks of slow rivers. He supposes that in swimming about they may have gone into shallow water which was above 28° R., and so have died suddenly. The usual explanation is that they have died from want of oxygen in the shallow heated water, but this could hardly be the case, because they would surely have time to swim into the cooler deeper parts where oxygen is abundant.

TRANSACTIONS OF
The Medico-Chirurgical Society.

SESSION 1872-73.

MEETING IX., 2d May, 1873.—Dr Scott Orr, President in the Chair.

Dr C. Ritchie, Pollokshaws, and Mr G. Campbell, Dalmarnock Road Glasgow, were admitted ordinary members.

TREATMENT OF EFFUSIONS BY ASPIRATION OR SUCTION.

Dr Gairdner introduced for discussion the subject of aspiration or suction as a method of treatment in pleuritic and other effusions, and exhibited some recent forms of apparatus for the purpose. His remarks, he said, were not intended to treat the subject systematically or with anything like exhaustiveness, but only to be such an exposition of it, in connection with the instruments which he would exhibit, as might form a basis for a discussion of the subject. By bringing forward the subject in this way the society would be enabled to collate experience, and thus probably advance their practical knowledge. He might further premise that his remarks might not be limited to aspiration as a mode of treating pleuritic and other effusions, but would embrace the diagnostic applications of the procedure which were of equal importance; and he would also indicate the possible applications of the method to the evacuation of morbid fluids generally.

The subject of paracentesis thoracis had been discussed from the earliest periods of the history of medicine. The operation was described by Hippocrates, referred to by Galen, spoken of by Paulus Ægineta, mentioned down through the periods of the middle ages and the revival of letters, and onwards to the present time. It was hardly worth while, however, to go back on these old stories; suffice it to say, that except in the methods of procedure, there was absolutely nothing new in the modern ideas of the subject. The very questions agitated at the present day regarding it were discussed in the centuries before, and the first two centuries after the Christian era. The proper place in which to penetrate the chest, the method of operating, the bearing of the nature of the fluid on the success of the operation, the question whether the fluid should be drained off very gradually, or allowed to escape suddenly, the consequences of the admission of air into the chest—these were very old subjects of speculation, and most of them had been discussed with more or less emphasis by medical writers, from Hippocrates downwards to the time of Paulus Ægineta, and in no age of the history of medicine had they been entirely lost sight of.

One of these questions—that of the possible results of the admission of air

into the chest—had been very much discussed since the middle of the 17th century, when it was revived by Bontius, who thought that the dreaded dangers of such admission were mostly chimerical. But everything written on the subject before the time of Laennec may be said to be thus far set aside, inasmuch as up to that time there was no accurate diagnosis of fluid in the pleura, except in the case where fluid and air co-existed, giving rise to the Hippocratic succussion, or where the walls of the chest were so locally protruded by the fluid as to give rise to the character of a distinct abscess. It was not to be wondered at that surgeons should shrink from the performance of an operation for the evacuation of a fluid, the existence of which in any given case there was no means of absolutely verifying. In these circumstances the operation, as by almost general consent, was limited to the case of empyema. This was the state of matters when Laennec pointed out with great care the bearing of the new methods of physical diagnosis on the operation of paracentesis thoracis. He set down with much clearness the indications of the operation, and pointed the way to its extension to acute cases of pleurisy with effusion, and even to cases of chronic pleurisy as a last resource. Shortly after his time Louis gave a distinct bias against the operation by taking up the position that simple pleurisy is an affection which had very seldom a fatal result, while purulent pleurisy required the making of a free opening. Louis, in fact, left hardly any room for the operation of simple paracentesis; affirming that in the curable cases it was not wanted, while in the incurable cases something more was wanted. In 1835 Dr Davies, of London, strongly advocated the performance of paracentesis. In 1837 appeared the work of Dr Stokes, which was followed by that of Sir Thomas Watson, both of whom may be said to have generally opposed the operation on the ground that pleurisy, if curable at all, is curable without paracentesis. In 1841 there were communicated to the *Medico-Chirurgical Review* the materials of a posthumous paper by Dr Hope indicating the great amenability to treatment, especially with mercury, of chronic pleurisy with effusion. Dr Hope had himself treated successively 35 consecutive cases; and thus, at least by implication, he threw doubt on the necessity of paracentesis. In 1843 Trousseau read his famous memoir before the French Academy of Medicine, in which he brought forward a variety of cases of simple pleurisy in which an urgent necessity for operative interference existed, and showed that paracentesis is capable of giving great relief with comparatively little danger. Next year appeared a paper on the subject in the *Medico-Chirurgical Transactions* by Dr Hamilton Roe, and another in *Guy's Hospital Reports* jointly by Dr Hughes and Mr Cock, in which the latter gentleman insists on the greater safety of using a small sized trochar, and of taking precautions against the admission of air, which Dr Hamilton Roe thought a matter of little consequence. But Trousseau must always be considered as having been the man who, in the present century, had given the greatest impulse to the operation of thoracentesis. By performing it without that unreasoning fear which had hitherto attached to the operation,

without using any extra precautions, by employing it in cases of great effusion where there was risk of suffocation, and in which the fluid had not departed from the serous type—there being an absence of any suppurative phenomena—by his careful record of cases, and by the evident earnestness of his convictions, the great French physician had done more than any other man to popularize the operation. He avoided the more violent proceedings of the ancients, and said that there was no necessity to perforate a rib, or to make a free incision; he used a moderately-sized trochar, and showed that the operation was one of easy performance, and not dangerous in itself. But Trousseau did nothing to improve the methods of operating. This brought them down to 1850, in which year Dr Bowditch, of Boston, gave the details of a new operation, and he (Dr G.) thought their Parisian friends had been strangely oblivious of the services of Dr Bowditch. The instrument of the Boston physician was made after the model of one used by Dr Morrill Wyman of Cambridge, U.S. [Dr Gairdner here read an extract describing Dr Bowditch's instrument and operation, and summarizing his conclusions.]

In regard to his (Dr G.'s) own experiences in connection with the operation which went back to 1853, he hesitated for some time what position to take in reference to it. At that time he was not aware of Dr Bowditch's improved operation, but as far back as 1856 he had occasionally recourse to thoracentesis. His practice might be said to have been regulated very much by two maxims, (1) to use a small canula and trochar, and (2) not to aim at a complete evacuation of the fluid, but only to draw off the large excess of it, and in this way to accomplish the more important objects of paracentesis without the risk arising from the admission of air. In operating he encouraged the stream of fluid by pressure on the chest, and kept his finger ready to stop the opening in case its closure might be required. In this way he relieved to his own satisfaction many cases. In 1855, Dr Addison, of Guy's Hospital, who had originally been favourable to paracentesis, and had personally witnessed the practice of Dr Hughes and Mr Cock, declared himself against the operation, on the ground that, though no bad effects might be immediately apparent, the mere fact of perforating the chest tended to cause the fluid to assume the purulent character, and thus any immediate gain might be more than counterbalanced by the ultimate mischief produced. The opinion of Dr Addison could not but have a certain influence in diminishing his (Dr G.'s) confidence in the operation. He continued in a suspended state of mind in regard to this treatment, believing that the great majority of cases would get well without it, and disposed, therefore, to favour the resolution of the disease by remedies as much as possible, waiting as long as he could before trying the operation, and, in fact, going very much on the principle not to interfere if it were possible. These were very much the views expressed in his "Clinical Medicine," published in 1862, in which book also he gave a letter from Dr Bowditch further explanatory of his views.

This conducted them by an easy stage to the modern era, which was marked by improvements in the methods of operating. At the discussion in the French Academy of Medicine a year or two ago, M. Guérin claimed to have been the originator of the application of the suction principle to paracentesis; but the French physicians, as he had already stated, seem to have quietly ignored the prior claim of Dr Bowditch. It needed little inquiry to convince any candid investigator that all the essentials of the aspiratory method were described and employed by Dr Bowditch many years before the French physicians had specially turned their attention to the subject. In 1870, M. Dieulafoy claimed to have given a new start to the operation, and he (Dr G.) really believed that, though that gentleman had not introduced any new principle into the method of operating, yet, by concentrating attention on it, and by utilizing to the utmost the marvellous ingenuity of French instrument-makers, he had given a considerable impulse to the operation.

Dr Gairdner then showed to the Society several instruments for paracentesis on the suction method, and exhibited them in operation. He drew special attention to an instrument which he had recently brought over from Paris, showed its applicability to diagnostic purposes, as well as for evacuating fluids in the chest, and how it could be used for other purposes—*e.g.*, as a syringe for the ear, as a spray apparatus, a double catheter for the male and the female bladder, an apparatus for eustachian tube, &c., &c. Dr Gairdner concluded by adverting to the application of the aspiratory method for the relief of strangulated hernias, to the evacuation of ovarian cysts, hydatid cysts of the liver, abscesses, and other morbid fluids.

Dr Lyon said that he anticipated good results in the cases of psoas abscesses which, by the method of aspiration, they would be able to evacuate very gradually of their fluid. Already he believed good results had been attained by hospital surgeons in these cases. But it was obvious that to evacuate abscesses filled with pus would require a larger trochar than some of these which had been exhibited, which were adapted only to evacuate serous liquids.

Dr McCull Anderson said that he recognized the propriety of such a subject being introduced by a physician rather than by a surgeon. Formerly, when physicians recommended paracentesis the operation was performed by a surgeon; but now, with these instruments working so simply and efficiently, every physician could carry his surgeon in his pocket. Of the instruments which were on the table, he preferred the original instrument of Dieulafoy which he had used in a great many cases. The improved instrument, as exhibited by Dr Gairdner, was too complicated. He considered the application of the aspiratory method to paracentesis as one of the most important contributions which had been made in the present century to therapeutics.

Dr Macleod said, that as a surgeon, he claimed as large an interest in the application of the suction principle to the evacuation of fluids as did the physicians; and from his own point of view he could very strongly support the favourable results of the employment of these instruments. He had used various kinds of these aspirators, but on the whole he preferred one on the table made to his own instructions, and for which he understood a large order had been given by the Russian Government through a house in

Berlin. It had the merit of simplicity in construction, and was perhaps the most portable of them all. He was a student of Trousseau in 1851, and he well recollected his operation of thoracentesis, and ever since he had taken a lively interest in the subject. With regard to the question of diagnosing the presence of these fluids, he thought that Dr Gairdner, with whose diagnostic powers they were all acquainted, had undervalued the power of his science. He understood him to state that in a considerable number of cases there was a doubt whether there was any fluid present [Dr Gairdner—And if any, what kind of fluid was present?]. He (Dr M.), was willing to admit that there might be doubt of the nature of the fluid, but he hardly thought that there could be much doubt as to its existence in any case. If, however, an exploration was required, Coxeter's exploring needle was a valuable instrument for diagnostic purposes. With regard to this mode of treatment his experience had lain mostly in the evacuation of abscesses, &c., and for this purpose a small canula and trochar was perfectly useless, as the canal soon became obstructed by the fluid. As far as he had been able to judge, the perils of the existence of air had been enormously exaggerated. It was, of course, extremely desirable to exclude the air, but if it did get admission he had never been able to see the terrible consequences. On one occasion, by inadvertently turning a wrong valve, he had pumped a psoas abscess full of air, but the patient made a remarkably good recovery. He might mention that he had tapped a case of hydrocephalus six times without producing any annoyance whatever.

Dr Wolfe thought the improved instrument exhibited by Dr Gairdner was too complicated for ordinary purposes. In surgical instruments, generally, this was to be considered a vice. In his own practice he had tried to discard complicated instruments, and he found the most simple to be the most serviceable, for they taught the operator the use of his fingers. Dr Wolfe exhibited the trochar and canula used by Trousseau when he introduced paracentesis thoracis. For ordinary purposes it was a serviceable instrument.

Dr Hugh Thomson said that, in these cases of apparently pleuritic effusions, the diagnosis was not always so certain as to preclude the possibility of error. With regard to the new apparatus exhibited by Dr Gairdner, it occurred to him that it would be a great improvement in it to make the exhausting syringe to enter the receiver by a separate opening from the opening connected with the tube leading to the cavity to be entered. If this were the case, as the receiver filled with the fluid it could be drawn off by this syringe, and the vacuum maintained as formerly.

Mr D. McVail said that Dr Easton, of Stranraer, when residing in Liverpool, had, in 1849, performed the operation of paracentesis thoracis, and, therefore, in the matter of priority, had the advantage of Trousseau, who, as Dr Gairdner had told them, had begun about 1852. The entrance of air was prevented in Dr Easton's operation by a simple contrivance. A tube, about a yard in length, of vulcanized indiarubber was filled with water, and one end placed on the mouth of the canula, and the other immersed in the fluid. This acted as a syphon, and was most effective in the purpose in which it was intended. Dr Easton, he might add, acted in the matter altogether independently of Dr Bowditch.

Dr Messer, Helensburgh, said that, for the general practitioner, the less complicated and more portable of the instruments would be preferable; but with regard to the tapping of the thorax he wished to ask Dr Gairdner what, in his experience, had been the ultimate results of the operation? His own experience of simple pleurisy was that the patients usually got better. In the matter of diagnosis it was sometimes difficult to distinguish consolidation of the lung from fluid.

Dr Hector C. Cameron had had experience of Dieulafoy's instrument in three cases of abscess, and in each of these cases he found difficulty arise. The first was a case of large abscess in the back of an old gentleman of 72 years of age, extending from close below the last cervical vertebra downwards, and to the right side as low as the last rib. This he frequently emptied, but notwithstanding it pointed at its most dependent part, and burst under an antiseptic dressing which he had previously applied. He has dressed it antiseptically since, and the old gentleman was now quite well, only a small sinus remaining, which yielded a drop of clear serum every third day when the dressing was changed. The second case was a large acute abscess which made its way from the pelvis into the upper part of the thigh, and pointed there. In this case the great suction power of the instrument cupped the cavity of a large quantity of blood. In the third case he could get no pus at all to flow through the instrument, and on opening the abscess—a large one near the knee-joint of a young man—with antiseptic precautions, he found it largely composed of curdy material.

Dr Scott Orr thought the Society much indebted to Dr Gairdner for the masterly way in which he had initiated the discussion, and for the exhibition of instruments by which he had illustrated his remarks. It was evident that the new French instrument exhibited was one evincing great ingenuity of construction, and capable of being applied in a great variety of ways. This being the last meeting of the session, he had also to congratulate the Society on the success which had attended their meetings. They had always during the session had a sufficient number of communications to meet their wants.

Dr Gairdner, in reply, said that Dr Macleod had insisted upon the necessity of using large canulas. In regard to abscesses generally, and especially psoas abscesses, he was no doubt correct, as in many of these cases the small sizes would be perfectly useless. But he could not agree with him if he meant that large canulas were always in all cases preferable to small ones. In cases of acute effusion of the pleura for instance, he held that a small sized instrument was to be preferred, and for these reasons—(1.) It was perfectly easy to draw off the fluid with a small sized canula; (2.) It made a smaller wound; and (3.) It rendered the use of too much force more difficult, and that too great force was not unattended with grave dangers, Dr Cameron's remarks had shown. On one or two occasions, he might mention he had himself been tempted to use too much force. In one of these—a case of phthisical pleurisy—he ruptured the pleura, and drew air from the cavity of the lung into the pleura; by and by he became sensible of the mischief done from the plashing sound in the chest. Dieulafoy insisted on the necessity of using a low degree of mechanical force, and the smallest canulas. Another caution was also greatly needed. Never attempt to do anything like empty the pleura. In fact, to anyone acquainted with the mechanical condition of the case, the idea of emptying the pleura was ridiculous. On this point he thought that their German friends had much erred, and caused others to err. When he was over in Berlin the instruction which he constantly heard given was to extract *all* the fluid. Anything more chimerical he could not conceive. What they should do is in each case to draw off only the excess of fluid, by numerous operations repeated perhaps two or three times a week. With regard to the assumption of infallibility in diagnosing fluid in the chest, he would venture to say that such mistakes were not very rare, notwithstanding Dr Macleod's flattering supposition of the impeccability of medical men in such circumstances. With regard to the ultimate result of the operation, it was necessary to speak with much

caution. Primary pleurisy was so often based on the tubercular diathesis that in very few cases could they be quite sure that thoracentesis had been followed by absolute cure. In a great many cases he could testify that it afforded great relief, and it had saved some people from imminent death, and in not a few did the ultimate result *appear* to be satisfactory; but, without watching the cases over a period of years, he would not venture to say that a cure had been effected. With respect to the application of the aspiratory method to such cases as those of hydrocele, he really could see no advantage to be gained. In such cases the surgeon had, as it were, the whole thing under his hand, and it was as easy to *squeeze* out the fluid as to *draw* it out. The instructions which, in his view, appeared the most necessary he would thus summarize. In view of the possibility of errors in diagnosis, perform tentative operations with great care. There was no disadvantage in using a fine needle first, and then a large one afterwards. Never attempt anything like complete exhaustion of the fluid. As to its immediate object, the operation should be simply palliative. Don't attempt too rapid exhaustion of the fluid, and beware of using too great force.

Medical Intelligence, &c.

EXTRA-MURAL LECTURES ON SURGERY.

We beg to direct attention to the course of lectures on Surgery advertised by Dr Hector C. Cameron. We have every confidence in Dr Cameron's ability, and heartily wish him success. We hope his venture may meet with so much favour as to induce others to follow his example in other departments of medicine. No one can have any doubt of the healthy influence of competition in teaching, introduced with such restrictions as the licensing bodies have the power of imposing. A teacher who shrinks from competition only manifests an instinctive sense of the risks of natural selection.

THE GLASGOW LYING-IN HOSPITAL.

We observe from the thirty-eighth annual report of this institution that a greater number of women were attended in child-bed during last than during any previous year. The number of students who availed themselves of this excellent field for the study of practical midwifery was also much greater than it has ever before been. As a matter of history, we extract the following statement of the Directors, relative to the recent endeavour to amalgamate their institution with the University Lying-in Hospital:—

“Before proceeding to report on the general affairs of the Hospital, your Directors have to state that in the course of the past year the Directors of the University of Glasgow Lying-in Hospital made a proposal to your Directors that the two Hospitals should be amalgamated.

“This matter was duly considered by your Directors, they being desirous, while they did not invite the proposal, that it should receive full consideration—so that, if the amalgamation really was desirable for this Hospital, and on public grounds, it should not be rejected. The Directors of the University Hospital at first proposed that the Senate of the University should nominate one Physician to the Amalgamated Hospital annually, whose appointment should only be complete when ratified by the Directors of the Amalgamated Hospital, as in the case of the other Physicians.

They at the same time desired a due representation of the Senate of the University in the General Board. They further explained that, in the event of an amalgamation, they would hand over to the Amalgamated Hospital a sum of £870, and that their income from subscriptions and students' and nurses' fees amounted to about £180 a year. Deputations were appointed by both Boards of Directors to confer on the question of the amalgamation. These deputations met, and, as mentioned in their joint minutes, after considerable discussion, it was agreed to substitute the following proposal in lieu of those contained in the minute of the Directors of the University Hospital, of date 6th August, viz., to give to the Senate of the University of Glasgow the power of appointing three Directors out of nineteen, of which number it is suggested the Board of the Amalgamated Hospital should consist. The two deputations unanimously agreed to recommend this latter proposal to their respective Boards. It was laid before your Directors on 1st October. At that meeting your Directors expressed their opinion that the amalgamation would be of advantage both to the school of medicine in Glasgow and to the public; and they considered the terms of the amalgamation proposed by the deputations such as they could recommend to the subscribers and contributors. They therefore unanimously approved of the deputations' report, on the footing that it is suggested that the Board of the Amalgamated Hospital should be constituted as follows, viz.:—The Lord Provost of the City of Glasgow a Director *ex officio*; eight Directors annually nominated by public bodies, viz., two by the Faculty of Physicians and Surgeons of Glasgow, one by the Town Council of Glasgow, one by the Merchants' House of Glasgow, one by the Trades' House of Glasgow, and three by the Senate of the University of Glasgow; and ten Directors to be annually chosen by a Court of qualified contributors and subscribers, to be held on the last Tuesday in November yearly.

“The proposal was admitted to and approved of by the Board of the University Hospital, on 15th October last. Both Boards continued the Committees who had formed the deputations, with instructions to prepare together a draft of a constitution for the Amalgamated Hospital, to be submitted to your Directors for approval.

“The two deputations did adjust a draft of a constitution, which was approved of by a majority of your Directors, with the alteration that, instead of the Faculty of Physicians and Surgeons of Glasgow nominating two Directors, their President should be a Director *ex officio*, and that they should only nominate one other. The draft was also approved of by the Directors of the Glasgow University Lying-in Hospital.

“A special meeting of your contributors and subscribers was thereafter convened on 23rd January, to consider the question of the amalgamation, and, if that was approved of, to adjust the draft of the new constitution. At that meeting, however, the contributors and subscribers did not accede to the proposed amalgamation.”

MEDICAL SERVICE UNDER THE DUTCH GOVERNMENT.

“Much of the failure of the Dutch troops in the Acheen campaign has been due to deficiency in the medical department, and accordingly the Government has announced its willingness to employ British surgeons. The conditions under which our own young countrymen are invited to serve have just been communicated to me, and are as follows:—The applicant must lodge with the Chief of the Medical Staff of the Netherlands Army, at the Hague, his name and address, along with satisfactory references as to character. He must be under thirty-five years of age; he must be able to speak either Dutch, or French, or German, well enough to be able to pass a short *viva voce* examination. His engagement will be

for five years, and may be prolonged. Successful candidates will take rank with 1st Lieutenants of the staff; the pay will be 2250 guilders (about £185) per annum, with prospects of promotion. The Netherlands Government will grant a first-class passage to the seat of war, and a premium of 4000 guilders about (£330.) The Batavian Republic has never forfeited the character given to it by Dugald Dalgetty, according to whom 'its behaviour on pay-day might be an example to Europe.' Besides, the attractions of the Dutch Indies to the scientific surgeon (especially if he be a naturalist) are at once rich and unique."—*Scotsman*.

SUCCESSFUL CANDIDATES FOR INDIAN MEDICAL SERVICE.

The following Candidates for H. M.'s Indian Medical Service were successful at the Competitive Examinations held at London, in February, and at Netley, in August, 1873, after having passed through a course at the Army Medical School at Netley. The maximum number of marks was 6900. We congratulate Mr Wilkie on his distinction:—

| Names. | Studied At. | Number of Marks. |
|----------------------------|--------------------------|------------------|
| 1. Wilkie, D. | Glasgow and Berlin ... | 6142* |
| 2. Battersby, W. E. | Dublin | 5745 |
| 3. Wall, A. J. | London | 5613 |
| 4. Moodie, R. | Edinburgh and Vienna... | 5511 |
| 5. Goldsmith, S. T. | London | 5144 |
| 6. Thomas, A. A. | London | 4651 |
| 7. Tuohy, F. S. | Cork | 4616 |
| 8. Moynan, W. E. B. | Dublin and Galway ... | 4586 |
| 9. MacDonald, D. P. | Dublin, Cork, and London | 4413 |
| 10. Browne, W. R. | Dublin and Belfast ... | 4360 |
| 11. Baker, O. | London | 4343 |
| 12. Mallins, H. | Dublin | 3915 |
| 13. Wright, F. W. | Edinburgh | 3904 |
| 14. Robinson, M. | London | 3865 |
| 15. Leapingwell, A. | London | 3460 |
| 16. Dill, J. S. | Belfast and Dublin ... | 3200 |

MEDICAL OFFICER'S QUARTERLY REPORT.

During the first quarter of 1873, the general death-rate was 31 (31·5 exactly) per 1000 living; the birth-rate 49 per 1000 living. The death-rate per 1000 living under one year was 180, one and under five years 64 (under five years 93), five years and upwards 21. The deaths under five years amounted to 41 per cent. of the total deaths. The deaths under one year amounted to 48 per cent. of the deaths under five years, to 19 per cent. of the total mortality, and 15 per cent. of the total births.

Of the births, 9½ per cent. were illegitimate.

Of the deaths under one year, in only 64 per cent. was the cause of death certified; of the deaths one and under five years, 77 per cent.; of the deaths above five years, 85 per cent. There was therefore no proof of medical attendance on 36 per cent. of those who died under one year, on 23 per cent. of those who died one and under five years, and 15 per cent. of those who died above five years.

Of the children who died under one year, 14 per cent. were illegitimate; of those who died one and under five years, 8 per cent. were illegitimate.

* Has obtained the Herbert Prize.

Of the legitimate children who died under one year, 67 per cent. were certified, while of the illegitimate under one year, only 46 per cent. were certified. There was, therefore, no proof of medical attendance on 33 per cent. of the legitimate and on 54 per cent. of the illegitimate children who died within their first year. Of the legitimate children who died one and under five years, 78 per cent were certified; while of the illegitimate, 60 per cent. were certified. There was therefore no proof of medical attendance on 22 per cent. of the legitimate and on 40 per cent. of the illegitimate children who died between their first and fifth years.

The Statistical Subdivisions show local variations, at one extremity of which are the suburban districts of Springburn and Maryhill, and the urban district of St Rollox, with death-rates of 20·5 and 21·6; and at the other extremity, Bridgegate and Wynds, with a death-rate of 52. Treating Springburn and Maryhill as one Statistical Subdivision, retaining the Registration District of Blythswood as another, and dividing the Subdivisions according as their death-rates are under 30, under 40, or under 50 per 1000, we get four groups, and taking the average of the death-rates, &c., prevailing in those groups, we get the following gradation of results:—

| GROUP. | DEATHS. | | | | BIRTHS. | | Percentage of Deaths under One to Births. | Persons to Acre. |
|-----------|----------------|----------------------|--------------------------------|------------------------|---------|-----------------------------|---|------------------|
| | Rate—All Ages. | Rate—Under One Year. | Rate—One and under Five Years. | Rate—Above Five Years. | Rate. | Percentage of Illegitimate. | | |
| I.,..... | 24 | 133 | 49 | 17 | 35 | 6 | 12 | 131 |
| II.,..... | 32 | 203 | 62 | 22 | 43 | 9 | 16 | 212 |
| III.,... | 43 | 280 | 77 | 30 | 46 | 16 | 20 | 400 |
| IV.,... | 52 | 329 | 96 | 38 | 30 | 25 | 24 | 481 |

THE WOMAN DOCTOR QUESTION—AN ALLIANCE.

Last week we announced a rather significant alliance. No one will dare question the professional standing and respectability of Dr Abraham Jacobi, of New York. Dr Jacobi was a widower, we believe, but concluded to again enter the bonds of matrimony. Miss Mary C. Putnam, daughter of the distinguished publisher of that name, some years ago entered upon the study of medicine, considering it a proper sphere for the exercise of her talents and abilities. The sequel proved that she was equal to the situation, as she distinguished herself as a student both here and in Europe, taking, if we remember rightly, the highest honours in Paris. While in Europe she was a regular and frequent correspondent of this and other medical journals, and her letters were among the best that were ever furnished to the medical press. In course of time she returned to New York and established herself in the practice of medicine in that city. We have never heard what her success was as a practitioner, but if it was measured by her acquirements and ability (not, we are sorry to say, by any means always the case), it must have been more than respectable. Well, Drs Jacobi and Putnam have united their

fortunes, social and professional, and as Dr Jacobi's specialty has been the diseases of children, we presume the specialty of the firm will be the diseases of women and children. Success to them!—*Medical and Surgical Reporter, Philadelphia.*

BOOKS, PAMPHLETS, ETC., RECEIVED.

- Lessons in Elementary Anatomy. By St George Mivart, F.R.S., &c., Lecturer on Comparative Anatomy at St Mary's Hospital, &c. pp. 536. London: MacMillan & Co. 1873.
- The Pathology and Treatment of Diseases of the Skin. By J. L. Milton, Senior Surgeon to St John's Hospital for Diseases of the Skin, &c. pp. 358. London: Hardwicke. 1872.
- Proceedings of the Dublin Obstetrical Society for Session 1871-72. pp. 164. Dublin: Farmin & Co. 1872.
- Transactions of the Obstetrical Society of London, Vol. XIV., for the year 1872. pp. 388. London: Longmans & Co. 1873.
- The Microscope and Microscopical Technology, a Text-book for Physicians and Students. By Dr Heinrich Frey, Professor of Medicine in Zurich. Translated and Edited by George Cutter, M.D. pp. 658. New York: William Wood & Co. 1872.
- Principes d'Electrotherapie. Par le Dr E. Cyon, Professeur de Physiologie a l'Université de Saint Petersburg. pp. 278. Paris: Bailliere et Fils. 1872.
- The Mechanism of the Ossicles of the Ear and Membrana Tympani. By H. Helmholtz, Professor of Physiology, Berlin. Translated from the German. pp. 70. New York. 1873.
- An Introduction to the Study of Clinical Medicine, being a Guide to the Investigation of Disease, for the use of Students. By Octavious Sturges, M.D., Cantab., Ass.-Physician, Westminster Hospital. pp. 132. London: Smith, Elder & Co. 1873.
- Medical and Surgical History of the War of the Rebellion (1861-65), prepared in Accordance with Acts of Congress, under the Direction of Surgeon-General Joseph K. Barnes, U.S. Army. Washington: Government Printing Office. 1870. Medical Volume and Appendix, pp. 726, and 366; Surgical Volume, pp. 650.
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